The Builder.

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ILLUSTRATIONS.

Illustrations to Professor Aitchison's Royal Academy Lectures:—

Nôtre Dame, Paris: West Front ..... *Double-Page Zinc Block.*

Beauvais, East End ..... *Single-Page Ink-Photo.*

Nôtre Dame de L'Epine (Marne) ..... *Single-Page Ink-Photo.*

Proposed Church of St. James the Greater, Leicester: Interior View. Messrs. Goddard, Paget, and Goddard, Architects ..... *Double-Page Ink-Photo.*

"Bardencroft," Saltburn-by-the-Sea. Messrs. A. W. Brewill and B. E. Baily, Architects ..... *Single-Page Photo-Litho.*

"The Limes," Edwalton. Messrs. A. W. Brewill and B. E. Baily, Architects ..... *Single-Page Photo-Litho.*

Blocks in Text.

Church of St. James the Greater, Leicester.—Plan ..... Page 223

"Bardencroft," Saltburn-by-the-Sea.—Plan ..... „ 224

Details of Metal Casement made by the "N. A. P." Window Company ..... Page 230

"The Limes," Edwalton, Nottingham.—Plan ..... Page 224

Ironwork Design ..... „ 225

CONTENTS.

Proposed New Drainage By-laws for London 213

On Some American Theatre Designs 214

Notes 215

The Advancement of Architecture 217

The Royal Institute of British Architects 219

The London County Council 221

The Provident Institution of Builders' Foremen and Clerks of Works 221

The London County Council Inquiry 222

Competitions 222

Architectural Societies 222

Engineering Societies 223

Illustrations of French Cathedrals 223

Proposed Church of St. James the Greater, Leicester 223

"Bardencroft," Saltburn-by-the-Sea 223

"The Limes," Edwalton, Nottingham 223

Drawings for the Royal Academy 224

Books: J. S. Gardner's "Ironwork;" J. Pennell's "The Illustration of Books;" J. Newman's "Metallic Structures:" D. K. Clark's "Practical Tunnelling;" "Laxton's Builders' Price Book for 1897;" "Kirkpatrick's New System of Carpentry;" F. A. Fawkes's "Architects' Joinery and its Ornamentation;" F. E. Hulme's "Familiar Wild Flowers 224

Trade Catalogues 226

The Architect's Model 227

The Drawing of "A Thirteenth Century Architect." 227

"Sketches of London Street Architecture" 227

The Student's Column: Specifications.—X.—Joiner 227

General Building News 228

Sanitary and Engineering News 229

Stained Glass and Decoration 229

Foreign 229

Miscellaneous 230

Capital and Labour 231

Legal 232

Meetings 233

Recent Patents 234

Some Recent Sales of Property 235

Tenders 235

Proposed New Drainage By-laws for London.

BY the Public Health (London) Act 1891, Section 39 (1), the London County Council was instructed to "make by-laws with respect to water-closets, earth-closets, privies, ashpits, cesspools, and receptacles for dung, and the proper accessories thereof in connexion with buildings, whether constructed before or after the passing of this Act." In 1893 these by-laws came into operation, and no sooner have architects and builders become familiar with them than a new set of by-laws relating to water-closets and other matters is proposed. This time, however, power is sought under the far-away Metropolis Management Act 1855, as Section 39 of the more recent Act is not sufficiently comprehensive to include such matters as subsoil drainage, rain-water pipes, and the waste-pipes from baths, sinks, &c.

Certainly the sanitary regulations of London are in an almost hopeless muddle. What with the London County Council, the Commissioners of Sewers, and the forty Vestries—each with its own regulations—matters have come to a pretty pass. The proposed by-laws of the County Council are apparently intended to supersede the regulations of the Vestries and to impose a uniform system of sanitation throughout the whole of the Metropolis with the exception of the City. Perhaps it has been discovered that the regulations of the Vestries were not legal. Be this as it may, the adoption of one set of by-laws applicable to nearly the whole of London is undoubtedly a step in the right direction, and one for which London architects and builders may well be grateful.

The proposed by-laws have been framed for the purpose of regulating the dimensions, form, and mode of construction of the pipes, drains, and other means of communicating with sewers, and the traps and apparatus connected therewith, and also for the purpose of providing for their proper cleansing and repair.

Many of the proposed by-laws are almost identical with existing regulations, either of the Council or of one or other of the Vestries. The first by-law is quite non-contentious, merely stating that subsoil drains must be disconnected from sewers by means of a suitable trap and ventilating opening. The second requires all rain-water pipes to discharge over or into properly-trapped gullies, and prohibits the connexion of water-closets, urinals, slop or other sinks, baths or lavatories, with rain-water pipes; the only objection that can be reasonably made to this is that the waste-pipes from baths and lavatories might be excepted from the prohibition, and a proviso inserted similar to that in the Clerkenwell Vestry's Regulations, namely, "waste-water pipes in the upper floors of premises. . . . if connected with rain-water pipes, shall only be with such pipes as are outside the building, and the junctions shall be made at such points outside the building as shall be easily accessible at all times," By-law 3 deals with drains, and comprises ten clauses. Drains may be of stoneware, cast-iron, or "other equally suitable material." Clause 2 gives the thickness of metal for cast-iron pipes, namely, $\frac{5}{16}$ in. for 3-in. pipes, and $\frac{3}{8}$ in. for 4, 5, and 6-in. pipes. Although 3-in. pipes are mentioned, in this clause they can only be used for the branch drains from rain-water pipes, as the following clause provides that all drains used for conveying "sewage" must be not less than 4 in. in diameter. The latter part of the third clause is the one to which the greatest objection will be raised, as it insists upon all sewage-drains being laid on a bed of concrete not less than 6 in. thick, and being "so constructed as to be watertight and to be capable of resisting a pressure of at least 2 ft. head of water," but the existing requirements of some of the Vestries are quite as stringent. The remaining clauses of By-law 3 do not call for comment; they are less exacting than several of the regulations now in force. By-law 4 provides for the usual disconnecting trap and inspection chamber, and By-law 5 prohibits right-angled junctions in drains. The sixth by-law deals with the ventilation of drains, and is an almost *verbatim* copy of the regulations in force in Islington; in one or two places the new by-law is less stringent than that on which it is based, but the size of the ventilation shaft is increased from "three inches" to "that of the drain with which such pipe or shaft may communicate," unless a soil-pipe, or slop-sink waste, be used as a ventilation shaft, in which case a diameter of $3\frac{1}{2}$ in. will suffice, provided the drain from it be not larger than 4 in. By-law 7 relates to waste-pipes from baths, lavatories, and sinks, and overflows from cisterns, &c., and is unobjectionable. Soil-pipes and their connexions with closets and drains are dealt with in the nine clauses of By-law 8. These follow in the main the existing by-laws of the Council; they are, however, more exacting in respect of the weights of soil-pipes ($3\frac{1}{2}$, 4, 5, and 6-in., lead pipes being increased from 65, 74, 92, and 110 lbs. per 10 ft. length to 73, 83, 104, and 125 lbs.; and $3\frac{1}{2}$, 4, 5, and 6-in. iron pipes being increased from 48, 54, 69, and 84 lbs. per 6 ft. length to 65, 73, 121, and 142 lbs. respectively), and cast-iron soil-pipes are forbidden *inside* buildings; on the other hand, the requirements respecting the position of the open tops of soil-pipes in relation to windows and roofs are simplified to one word, *safe*—the open end shall afford "a *safe* outlet for foul air"—the wire guard at the top is no longer compulsory, and the usual method of jointing pipes, &c., may be superseded by any other "equally suitable and efficient" method. By-law 9 requires the ventilation of the traps of water-closets where more than one are connected with the same soil-pipe; this by-law would be improved by the addition of the words, or "slop-sink" after the word "water-closet," wherever this occurs; it would then be made clear that water-closets and slop-sinks may be connected with the same soil-pipe, provided their traps are properly ventilated. The tenth by-law relates to slop-sinks, and is not immoderate in its requirements. By-law 11 throws on the owner of property the onus of repairing and maintaining "all pipes, drains, and other means of communicating with sewers, and the traps and apparatus connected therewith." This is a regulation which may induce carelessness in tenants and consequently inflict considerable hardship on owners, and we certainly think that reasonable objection may be taken to it. It is merely an application to "pipes, drains . . . . traps, and apparatus," of the principle already applied by the Council to "water-closets, earth-closets, privies, ashpits, cesspools, and receptacles for dung," but it is undoubtedly a principle which can be carried too far. The

carelessness of tenants and servants is usually responsible for the choking of traps and frequently for the stoppage of pipes, and we think that justice would be met by making both owner and occupier responsible, so that the owner need not be mulcted where the damage is due to the carelessness of tenants or their servants. The twelfth is the usual "penalty" by-law, and the thirteenth declares that the by-laws shall apply to all *new* sanitary work executed in existing buildings. The by-laws, therefore, are not retrospective; existing arrangements may remain so long, of course, as they are not nuisances.

Doubtless there are some persons who will condemn the proposed by-laws *in toto;* to these, sanitary regulations mean reduced profits and harassing supervision. With this class of men we have no sympathy. Others there are who fear that the stringency of the by-laws will unduly and unnecessarily enhance the cost of building in the Metropolis, and add to the already heavy burdens of householders. Indeed, we have received letters to this effect from several architects, who seem to regard the new regulations as a new tyranny. With the views of these we sympathise to some extent, but at the same time we must point out that sickness is far more expensive than sanitation, and if the regulations are the means of saving *one* person in every house from one illness of even moderate severity, the expense entailed by them will have been well spent. The proposed by-laws, moreover, are less exacting in several respects than many now in force, and, as they have the merit of unifying the regulations throughout the whole of London (with the exception of the comparatively small area of the City), we welcome them as a boon to architects and householders. They are not, perhaps, perfect—what is?—but, on the other hand, they are not unduly exacting. Indeed, they do not impose a cast-iron law in everything, but allow room for variation with varying circumstances and for the adoption of new and improved methods.

ON SOME AMERICAN THEATRE DESIGNS.

AS to the true architectural treatment of the theatre we are still, in England, in an uncertain or what, let us hope, is a transition stage. As far as concerns the construction of the house, the necessity of fire-proof materials, of a fire-resisting curtain, of the structural barrier to be maintained between the auditorium and the stage portion, and of ample exit staircases, we have arrived for the present at such a degree of general agreement that the description of one new theatre, in regard to these practical points, reads much like that of any other. But the architectural treatment mostly takes care of itself; there is no theory in regard to it, and no fixed aim. Nor is this likely to be otherwise as long as theatre-building is merely a commercial problem in the hands of professional experts, whose only aim seems to be to get the house into a paying condition as fast as possible. When public opinion shall be brought to perceive that a theatre offers one of the finest opportunities possible for architectural effect and expression, and that in this respect it is worth while to put such a building into the hands of one of the best architects of the day, and to allow a sufficiency of time for the maturing of a really fine design, then we may hope to have theatres which will be great architectural works in the highest sense. But evidently the time is not yet.

In this respect the Americans appear to be ahead of us in good intentions at all events. Several of the most important theatres in New York and elsewhere in the States are connected with the names of some of the first American architects. But when we look to them for some examples of characteristic architectural treatment of a theatre, we are obliged to confess to a disappointment.

Mr. Birkmire's small book on the planning and construction of theatres in America,* though it includes plans and also some constructional details which are of interest to architects, is in the main what is generally called a popular work, written in a light and easy style, with the evident aim of rendering the book agreeable and now and then a little sensational to the general reader. Still, it forms an interesting synopsis of the tendency of recent efforts in American theatre architecture, being illustrated with a number of views of the exteriors and interiors of theatres, reproduced from photographs, and therefore so far trustworthy in regard to the architectural treatment and effect of the buildings. And we cannot say that these designs afford us much help towards the development of theatre architecture. The discrepancy between the architectural clothing and the internal purpose and arrangement of the building seems even greater than with us, though in some cases the architecture *per se* is better than we usually see in English theatres.

The Metropolitan Opera House (New York), by Messrs. Cady, Berg, & See, presents the appearance of two great blocks of warehouses or offices, at the two corners of the front, connected by a rather lower central portion. Except that the buildings are not so high in proportion to their width, there is nothing to distinguish it from the common American type of lofty office buildings which we know so well. As the plan of this particular house is not given, it is impossible to say what relation this exterior design may bear to it, but certainly there is nothing whatever in the exterior aspect which in the least suggests a theatre. The conclusion from the appearance in the illustration is that it is really a group of blocks of offices with a theatre hidden somewhere between and behind them. This building, however, is fourteen years old. Abbey's Theatre, at the corner of Broadway and Thirty-Eight-street, is only about three years old, and was the first to be completed since the enactment of the new law relating to the building of theatres, and the law in the case of this theatre, we are told, has been strictly enforced. The exterior presents a square block of building of six stories, with ranges of small windows, suggesting nothing so much as a hotel with an unusually large entrance flanked by columns, which, running through ground and mezzanine stories, leaves a great hole in the centre of the front with by no means good effect. The name "Abbey's Theatre" appears in large letters on the balustrade above the cornice; certainly the only announcement, to the English eye, that this is a theatre. It is an ugly building, with not even a festive character about it. In this case also the plan is not given; perhaps it was thought that it would show too much. Turning to the new Act, printed at the end of the book, we seem to find some explanation of the design in the provision that under certain circumstances a portion of a theatre building may be used for business purposes. The wording of this paragraph is as follows:—

"When located on a corner lot, that portion of the premises bordering on the side street, and not required for the uses of the theatre, may, if such portion be not more than twenty-five feet in width, be used for offices, stores, or apartments, provided the walls separating this portion from the theatre proper are carried up solidly to and through the roof, and that a fireproof exit is provided for the theatre on each tier, equal to the combined width of exits opening on opposite sides in each tier, communicating with balconies and staircases leading to the street, in manner provided elsewhere in this section; said exit passages shall be entirely cut off by brick walls from said offices, stores, or apartments, and the floors or ceilings in each tier shall be fireproof."

The words "that portion of the premises bordering on the side street" would seem to imply that only one face of the theatre can be thus masked with offices, but the two faces of the building in this case are treated identically, and the whole becomes a warehouse. In fact it is actually described so in the book: "the exterior of the theatre presents a six-story office-building of light stone." That may be good for business, but it is a wretched way of treating a theatre architectually; and the enactment which affords opportunity for it is in itself a very unadvisable one, on practical as well as architectural grounds.

The Fifth Avenue Theatre, of which Mr. Kimball is the architect, is an exception. Here the main façade is, unfortunately, on the flank and not on the front of the house, which was unavoidable, as what should be the front is built up with houses, and the main entrance is at the side of the building. But the auditorium portion and the stage portion are here well and characteristically treated. The entrance façade is a rich and refined piece of decorative architecture in French Renaissance taste, rather spoiled by the poor columned portico belonging to the former house, which the architect has retained, with more consideration for his predecessor than for himself. The flank of the stage portion adjoining is treated very plainly in strong rusticated work, only connected with the other portion by carrying the cornice and string-courses through, and relieved by a lighter columned attic above. As an example of characteristic treatment of the two portions of the house this is an unusual and excellent piece of architecture. Possibly if this architect had had the advantage of a free site he would have seen the propriety of making some attempt to indicate the theatre form externally in his building. As the site is circumstanced he had not the chance of doing so. But the American theatre architects who deal with free sites do not appear to make any effort in this direction, so far at least as Mr. Birkmire gives us the opportunity of judging.

The huge establishment called Madison-square Garden, by Messrs. McKim, Mead, & White, with its tower modelled on the lines of the Giralda, is a really fine building, pretty

* "The Planning and Construction of American Theatres." By William H. Birkmire. New York: John Wiley & Sons. London: Chapman & Hall.

well known in this country through illustrations; though it certainly suggests a Hôtel de Ville rather than a theatre. We observe it stated in regard to the interior that "no attempt has been made at decoration, other than to leave all the construction open to view, and to paint the columns, roof-girders, &c., a light buff tint, and the beauty of the interior resides in the simplicity and in the light and graceful appearance of the construction." It is to be wished that there were more endeavour after this simplicity in the interior treatment of theatres, instead of the over-decoration, generally of a more or less tawdry kind, which meets us everywhere. There is the same want of reticence in most of the interiors figured in this book, though we admit that on the whole the taste in the decorative treatment seems superior to that of the majority of English theatres; only there is too much of it: no repose. It is rather amusing to notice the enthusiasm of the author over the effect of the endless repetitions of the domes in the Castle-square Theatre by means of huge mirrors set over the doors: a source of effect worthy of a restaurant, and rather a nuisance even there.

The constructional arrangements for carrying the galleries without front supports are such as we are familiar with here, and have no special interest for architects. We gather that a great deal more attention is paid to the comfort of the audience in the cheaper portions of the house than is usual in England, upholstered chairs being provided, in some of the theatres at least, even in the upper gallery. The favoured method of ventilation is by a *plenum* actuated by mechanical means, and propelling fresh air into the house under the seats, in one instance "through the hollow legs of the chairs." One very peculiar arrangement is mentioned in the Madison-square Theatre—the orchestra is placed on a platform above the stage and on the stage side of the curtain; an arrangement the supposed advantage of which, from any point of view, it is impossible to understand. The new enactment, however, has taken note of it by a clause to the effect that in future any arrangement for the orchestra aloft in this manner shall be on the auditorium side of the proscenium; a provision which, as the author observes, will probably prevent the system ever being employed again.

In the case of the Empire Theatre, in which the entrance to the "open court" required at the side of the building by the legal enactment is reached by a fireproof brick passage or tunnel, the author draws attention to one danger in connexion with such a mode of exit, besides the obvious one of allowing the chance of a crush, viz.: that if the main building had got fairly well on fire any falling beams or girders would crush in the roof of such a passage. However, we are not likely to have any such mode of exit allowed in any theatre in England in the present day.

Plans of most of the theatres mentioned are given, as far as the house itself is concerned, but in general these plans do not include the approaches and exits to and from the street, an omission which destroys a good deal of their value.

The book will be interesting, however, for architects to look at, though it is not specially an architect's book; and Mr. Kimball's treatment of the exterior of the Fifth Avenue Theatre, before referred to, is certainly worth attention.

NOTES.

Recent London Fires.

THE constant recurrence of serious fires during the present winter calls for comment. Ever since the notorious petroleum fire at Purfleet of some six weeks back we have had in rapid succession important conflagrations at Maple's Repositories, in the Borough, in the City, and elsewhere. Except for the sensational and often incorrect reports given in the daily Press, we hear little of these fires and the great risks involved. Little or no interest is taken in the subject by the public in this country, and we are under the impression that little interest is shown by the authorities directly concerned. But such a constant recurrence of fires of a similar nature, their rapid spread, and the usual result of a general "gutting" of the premises concerned, cannot be attributed to mere accident, and it is high time that London, like other cities of importance, should consider the best means of protection against fire in a more serious spirit. Fire protection comprises "fire prevention" as well as "fire extinction," and both these sections should receive careful attention. At present the Building Act alone assists "fire prevention," and the Fire Brigade is entrusted with the fire extinction. We are afraid that the subject of "fire prevention" has as yet only been treated in a most amateur manner, whilst there is ample room for the improvement and development of our Fire Brigade. The St. Mary Axe fire was in itself sufficient cause to institute an inquiry into the protection of the metropolis, for we have had nothing of this kind since Parliament reported on the Metropolitan Fire Brigade in 1877.

Peterborough Cathedral.

WITH reference to Mr. Ricardo's letter in our last, we are authoritatively informed that Mr. Ricardo's remark that the Dean and Chapter were "acting independently of their architect" in regard to one point is an assumption on his part entirely without foundation; as indeed we supposed at the time. Three or four years ago an old farmhouse and farm buildings belonging to the Chapter were taken down. As they were partly built of Barnack rag, it was arranged that all pieces of Barnack rag found in them of sufficient size to be of any future use should pass into the hands of Mr. Thompson, to be used where they would be available in the repair of the cathedral. The matter is long antecedent to the present controversy. We attached no importance to the fact, and merely mentioned it as reported to us by a member of the Institute party who visited Peterborough the other day, but who apparently did not get the story quite correctly. Any pieces used would require careful selection, no doubt; but why should they, with the weathered face outward, decay any more than the probably much older original stones of the front which are to be re-set? As to the rest of Mr. Ricardo's accusations, the portion taken down has suffered nothing from the weather, a temporary roof has been placed where the gable is removed, and all the stone taken down is under cover. Some people, however, are determined that the Dean and Chapter shall be in the wrong, whatever they do.

Discoveries at Athens.

THE *Athenæum* of February 20 reported the discovery at Athens of an ostrakon, or potsherd, bearing the name of Themistokles. Of this curious find we are able—thanks to the *Berliner Philologische Wochenschift*, February 27—to give our readers some further particulars. The ostrakon in question is a fragment of the brim of a large vessel, of black terra-cotta ware. On its surface has been scratched with a sharp tool the words "Themistokles Phrearrios" in archaic letters. There can be no question that Themistokles is the famous statesman, and that one of the actual ostraka that condemned him to banishment in B.C. 470 has come to light, Up to the present time only three similar voting ostraka had been discovered, one on the Acropolis, with the name of Megakles, son of Hippokrates, the uncle of Perikles, another, also on the Acropolis, with the name of Xanthippos the father of Perikles, and a third, bearing the same name but found in the Kerameikos. All three are published, and we hope the Themistokles ostrakon will shortly appear. It was found in the excavations being carried on by the German Institute near the Areopagos.

Cremation at Berlin.

A SMALL publication which was issued by the German "Cremation Society" on the occasion of the National Exhibition at Berlin, has reached us, and from it we see what rapid strides are being made in the cremation movement throughout Germany, or we may even say throughout the whole of Northern Europe. The Society—which, by the bye, had its own building at the Exhibition—works most energetically for its cause, and appears to be actively engaged in furthering the erection of furnaces and mausolea in the different provincial cities of Germany. At Berlin there is a complete equipment at the Central Cemetery, which cost about 1,000*l*. The number of members in the Berlin branch of the Society is 1,600, and there is room for 500 urns in their present mausoleum. The publication includes numerous illustrations of buildings erected in different parts of the country for the Society, more particularly among others that of the crematorium at Hamburg. There are also illustrations of the crematoria at Zürich, at Stockholm, &c., some of which prove that it is quite possible to obtain an agreeable architectural treatment of a crematorium.

The North Eastern Railway Strike.

THE strike of North Eastern Railway employés, although lasting but a few days, has resulted in unnecessary loss to the extent of some thousands of pounds to the Company, their customers, and to the men themselves. It has demonstrated clearly the futility of such rash and ill-advised proceedings, and forcibly illustrated the great power for good or evil exercised by the leaders of trades unionists. Had Mr. Harford's influence been directed to keeping up hostilities, or had he even adopted a neutral attitude in submitting the terms of armistice to the men, they would undoubtedly be out now, and the trade of Newcastle and other north-eastern ports seriously jeopardised. The North-Eastern officials have also acted very com-

mendably, and have proved that compromise is not necessarily incompatible with the preservation of dignity. Of course, much still remains to be settled, but it is a relief to find the parties to the dispute refraining from the unyielding attitude which has prolonged and embittered so many strikes. We are glad to note that Mr. Ritchie stated in the House of Commons on Monday that there are hopeful signs of a settlement without the mediation of the Board of Trade.

Proposed Sites for the Paris Salons.

THE Committee appointed by the Government to consider the question of arranging for places of exhibition for the two Salons until after the close of the Exhibition of 1900 has been holding sittings under the Presidency of M. Poincaré, a former Minister of Fine Arts. The following are the different localities already suggested: 1. a portion of the Tuileries buildings; 2. part of the garden of the Tuileries adjoining the Rue de Rivoli; 3. the Palais Royal; 4. the Place Vauban, behind the Ecole Militaire; 5. the alleys of the Observatoire; 6. the space along the fortifications between the Porte Dauphin and the Porte d'Auteuil; 7. the Ranelagh; 8. the Pelouse de la Muette. Almost all these sites are inadmissible for one reason or another. The neighbourhoods of the Ecole Militaire and the Observatoire are not sufficiently central, and the same objection applies to the fortification line between Auteuil and Passy; and if temporary buildings were established either at the Ranelagh or on the Pelouse de la Muette, there would be a general grumbling from the Paris population. The only two possible sites seem to be at the Tuileries and the Palais Royal; and even in regard to the latter the temporary giving up of the gardens can only be on condition of the consent of the inhabitants of all the houses which surround them; so that the question seems a difficult one.

The Building Trades Exhibition.

THIS exhibition will be opened on the 20th inst. by the Lord Mayor and Sheriffs of London, in its usual quarters at the Agricultural Hall. The formal opening will take place at noon, and at 3 p.m. on the same day the Architectural Association will make a visit to the exhibition. On Monday the 22nd the Association of Municipal and County Engineers are to make a special visit; on the 23rd the annual meeting of the Institution of Clayworkers will be held there; on the 24th there is to be a visit of the Builders' Merchants' Association, and on the 25th a Conference of House Painters and Decorators. There will thus be a good many interests of different kinds centred round the exhibition during its first week of existence. It is announced that the exhibition will contain, besides the usual trade exhibits, objects on loan from South Kensington Museum, the Corporation of London, and the City Companies; and also architects' drawings. The latter element in the last exhibition did not amount to very much; perhaps the management may have been fortunate enough to have obtained more support in that kind from architects for the present exhibition.

Institution of Civil Engineers of Ireland.

THE twenty-fifth volume of the "Transactions of the Institution of Civil Engineers of Ireland" contains five papers read at meetings of the Institution, of which that by Mr. Alfred Price on "The Location, Construction, and Equipment of Light or Secondary Railways in Ireland," is perhaps at the moment of the greatest interest. He proves once more that a light railway is not necessarily a narrow gauge one, nor is a normal gauge line of necessity a heavy, costly line; though, of course, the local circumstances of each case must decide the best policy to adopt. Mr. A. Gore Ryder contributes a paper on "Rough Testing of Portland Cement for Practical Men," which is well worth reading by those who have to deal with small quantities of Portland cement, and who therefore cannot incur the expense of the usual laboratory tests. "Recent Advances in Bacterio-Chemical Study of Sewage and other Polluted Waters," by the Curator in the Royal University, Dublin—Mr. W. E. Adeney—is the longest, and to some, no doubt, the most instructive paper. Results of elaborate experiments are given, showing the two successive stages which micro-organisms bring about in the sewage, and also the extent to which atmospheric oxygen is necessary for the natural process of sewage purification. A series of notes by Mr. John Purser Griffith on "Manganese Steel and some of its Uses" details some of the situations in which Mr. Hadfield's most valuable material may be used with great advantage. Were it not for the drawback that it is next to impossible to do anything in the nature of machining on it, manganese steel would, doubtless, come into more general use. The remaining paper by Mr. Karge Parry, on "The Administration of the Irish Sanitary Acts by Local Authorities," points out several weak spots in the Act of 1878, and is of interest to those connected with such work.

Birmingham Architectural Association.

THE Annual Report of the twenty-second session of the Birmingham Architectural Association records an increase in the number of members, and makes special mention of the work that is being done for architecture by the Birmingham School of Art. Attendance at the classes there is strongly urged on the student members of the Association. In the sketching class, which is reported to have been well maintained this year, the practice of time sketching from photographs has been encouraged as a means of promoting the faculty of rapid sketching out of doors. The Report admits that this method is not all that could be wished; it may be useful to a certain extent, but we should suggest that time sketching from any objects in the round which present a perspective problem—such as a chair, a table, &c., would afford better practice in this sense than sketching from photographs where the perspective is already made to hand. We notice that of the prizes offered by the President for the best set of sketches and measured drawings only the second prize was awarded, as the condition was not fulfilled of accompanying the drawings by a short account of the buildings sketched, a decision which we quite approve of. The requirement that an account should be given of the building sketched is a very useful one. The Report is embellished by several pleasing though slight sketches by members—memorials of the visit of the Association to Oxford.

Albert Gate.

A GREAT deal has been heard during the last few years of the necessity for widening narrow parts of the Strand, though little has yet been done to effect this. It may seem therefore a useless task to point out another place where the congested state of the traffic requires that some measures should be taken to widen the thoroughfare. This is on the Knightsbridge-road, immediately to the east of Albert Gate. The traffic in this place becomes daily in a more congested state. Nor is this surprising, as practically three streams of traffic going west, namely, the main Piccadilly stream, that from Grosvenor-place, and that from Park-lane and Hyde Park, all converge at this gully. In the opposite direction come three opposing streams—from Kensington, from South Kensington, and from Sloane-street. The result is that extreme delays and inconvenience arise. This state of things admits of an easy remedy by the widening of this piece of roadway. It is a question of pounds, shillings, and pence. But the growth of London requires that this kind of work should be done if the traffic of the Metropolis is to be properly conducted.

The Hall, Gray's Inn.

UNDER the superintendence of Mr. Isaacs, Architect and Surveyor to the Society, the cement coating is being picked off the south side of Gray's Inn Hall, so as to expose the red Dutch brick work of the wall and the quoins of the buttresses. The north side was similarly treated five or six years ago; our passing comment upon the work occasioned some correspondence in our columns for October, 1891. The hall was rebuilt in 1556-9, at a cost of 863*l.* 10*s.* 8*d.*, as is stated in the "Origines Juridiciales" of Dugdale, who cites an account (no longer extant) rendered by Sir Gilbert Gerard, Treasurer, in 1559. Until the alterations—we believe by William Wigg—begun in 1826, it formed an almost perfect example of its kind and period. The gables were marked by ascending battlements, in step form, of brick; the lateral walls were finished with plain parapets. On the tiled roof stood a wooden lantern in three stages capped by a boldly projecting cornice and a leaden cupola, with ball and vane—a characteristic composition in striking contrast with its sorry successor. The repairs comprised a substitution of slate for tile on the roof, the placing of angle-ledges on the crow's-rests, the covering of these, together with the walls, with compo or plaster, and the alteration of the arches over the roadway at the west end. On the hall's south side a lavatory has been built between the two buttresses of the eastern bay. The hall windows are unusually rich in armorial bearings; the bay window in the north wall contains some coat-arms set up therein *temp.* Elizabeth, with many others that were engraved for Dugdale's "Origines." These suffered much damage from a subsequent storm; they were reinstated as completely as was then possible, and in 1871 were re-arranged, and protected with antique glass. There is a tradition that the oaken screen, of rich design—the open gallery-front, above, is of later date—and some of the dinner-tables were given to the Inn by Elizabeth. The Society possess a coloured drawing, ascribed to Wigg, showing the hall and chapel from the north, as they appeared before the changes were made to which we refer.

Cheyne-walk, Chelsea.

THE lease of "Queen's House" is offered for sale. It is No. 16, Cheyne-walk, and is believed to have been occupied by Katharine of Braganza—her initials are on the wrought-iron gates—who returned to Portugal *circa* 1692. The handsome, albeit simple, elevation, quite after the style of Wren, has been impaired by the addition of an oriel on the first and second floors beneath the central pediment. In October, 1862, the house was taken by the two Rossettis, Mr. George Meredith and Mr. Algernon Swinburne. The joint occupancy did not endure for long, but Dante Gabriel Rossetti continued to live there until his death in 1882. In the garden he kept his menagerie, and there is the sycamore tree he painted in some of his pictures. In July, 1887, Mr. Holman Hunt unveiled a memorial which Rossetti's intimate friends had set up in the public garden opposite "Queen's House." It consists of a grey granite drinking-fountain, designed by Mr. John P. Seddon, with a quarter-length figure of the poet, an alto-relievo in bronze, modelled by Ford Madox Brown, and is illustrated in the *Builder* of April 17, 1886. A view in Mr. Beaver's "Memorials of Old Chelsea" shows the house with a figure of Mercury rising from the roof.

Suburban Theatres.

"THE Suburban Theatre" was the subject of an interesting paper read this week before the Playgoers' Club by Mr. Mulholland. The movement in connexion with the suburban theatres is of recent date, and Mr. Mulholland was practically the pioneer with the Camberwell Theatre, opened in 1894. Apart from the greater convenience of the suburban theatres to the inhabitants of the outlying districts, it should be remembered that the modern playhouse, erected on cheaper ground, is more spacious, more comfortable, better ventilated, and better lighted than many of the older central theatres of the Strand district. There is not the slightest doubt that the greater comfort enjoyed in a suburban theatre has much to do with the popularity of these institutions in their respective localities, for it is anything but a pleasure for people travelling from Hammersmith, Camberwell, or other suburbs, who are already tired by their long journey, to be penned up in some of the structures in which drama is presented to Central London.

Results of Sanitary Inspection.

THE Report of the Medical Officer for the Leyton Urban District Council gives a proof of the salutary results of house-to-house inspection in such a district. A number of cases are given in a tabulated form in double column, the one column stating the discoveries made as to the insanitary state of property, the other column the remedies applied as a consequence of the action of the authorities. The statement gives a very satisfactory proof of the good effects of careful inspection and official action.

The Paris Exhibition.

AMONG the various schemes of private projectors submitted to the Managing Committee for the Paris Exhibition of 1900, the following are those relating to architecture and construction which have received the sanction of the Committee: the "Palais de la Presse et de la Publicité;" an iron turning pavilion; a theatrical museum, of which M. Nenot will be the architect; moving platforms for the transportation of visitors (the projectors are MM. Blot, Eugène Hénard, and Thévenet-Le-Boul; restorations of ancient French monuments; a modern house; the "Palais des Femmes"; the "Palais des Joujoux"; the "Rue des Siècles," a street of buildings of various ages; the palace for glass and ceramic work; and lastly the "Encyclopédie Artistique et Géographique," in which each country will be represented by a street or an architectural monument, a proposal of MM. Dezermeaux and Leblanc. Altogether the Exhibition of 1900 promises to be a rather curious collection.

THE ADVANCEMENT OF ARCHITECTURE *:

WITH SOME REMARKS ON THE STUDY OF GOTHIC.

THERE must be an interest in all past architecture, partly on account of its obtrusiveness, and partly because it embalms the knowledge, skill, and taste of a bygone age; but we take a still deeper interest in those particular examples of it, that have excited in us strong emotions we often hardly know why. Some call forth our admiration by their perfection, some by their size, and some by their skill, and when the skill shown is almost superhuman, we are naturally curious to know how it came about. History, however, mostly seizes on those military achievements of nations which give them supremacy and permanence, for, as some learned man very truly said, history is only the history of successful military people, as the unsuccessful are destroyed or absorbed. History, as a rule, takes little or no account of those advances in the arts which add comfort, ease, and elegance to society, and does, too, its main business, the fighting of great battles, very badly indeed. We, however, occasionally catch glimpses of other matters; historians occasionally quote laws which throw a little light on the improvements in husbandry, in food and its cooking, on the clothing and housing of the people, on their furniture, weapons, implements, ornaments, games, and amusements, as well as on those fine arts they cultivate. Our main knowledge of these subjects is, however, owing to occasional notices in works on other subjects, such as Plutarch's Lives, Plato's Dialogues, Aristotle's Ethics, and Politics, &c., and to stray treatises that have come down to us, such as Vitruvius' work on Architecture, the Elder Pliny's Natural History, Pausanias, &c.

Analytical as this age is, you cannot analyse any subject completely until you have the whole of it before you, and though what is known and analysed has thrown more light on deceased architecture than was ever known before, the necessary information to write complete histories of any architecture from Greek downwards is still wanting. Gothic, since its abandonment in Renaissance days, was generally overlooked until the last century. I say generally, for Wren certainly studied its construction. It has, however, points of attraction that are not found in any other phase of architecture, for though lineally descending from Greek architecture through Roman, Byzantine, Romanesque, and Saracenic, it varies so much in form and principle from them that it may be looked on as a new art. It should be attractive as a study, as it went through so many phases during its short existence of little more than 400 years. It is in some respects the most interesting of all architectures, for it made giant strides in construction, and was quite original in its æsthetic presentations and in its emotional effects. In spite of the researches of Professor Willis and Viollet-le-Duc, to speak only of its typical elucidators, there is still a huge body of information wanted to give us due information on the subject. We not only want a vast amount of knowledge of Mediæval times in the country or countries that gave Gothic architecture birth, but we also want a much greater knowledge of Saracen records than we have hitherto got. Every schoolboy is unfortunately not like Dr. Thomas Young, who, after correcting his master's Greek, taught himself Arabic, French, and Hebrew in his spare time. I am loth to make any remark on so great a man as Viollet-le-Duc, but I cannot help thinking that his patriotism ran away with him, for though he admits that the Crusaders, during their stay in Palestine, got advanced geometry from the Saracens, he says that though he has heard much of Saracen influences, he has never found any signs of it in Gothic, but believes that all its peculiarities were due to French invention. I confess that I think he was wrong there, for surely the cusp was got from the Saracens. Some think the Saracens took the idea from the upright tombs excavated in the rocks of Persia, where the sinkings for the head and shoulders made the complete cusp and two half-ones on either side, while others believe it was got from Northern India, where cuspidation was employed at an early date, though what that date was nobody knows. Cusped arches were certainly used by Abd-el-Rahman in his mosque at Cordova, built in the latter part of the eighth century; and the earliest Gothic was without cusps. It never appeared to me that there was much direct adaptation of Saracenic architecture, but a great deal of indirect influence, for we must recollect that the Saracens were probably the most civilised people in the world at the time of the Crusades. The gorgeousness of the Court of Muctadir, the magnificence of his palace and its fittings, astonished the ambassadors of Constantine Porphyrogenitus, accustomed as they were to all the splendour of the Byzantine Court; this was early in the tenth century. In the second quarter of the twelfth century, Averrhoes was born, and died towards the end of it. He made the great commentary on Aristotle, spoken of by Dante, a translation of which is said to have been used in the Italian universities until the last century. The late Dr. Middleton heard Aristotle commented on, probably according to Averrhoes, in Arabic at the University of Karouan.

Although Averrhoes was the greatest of the Arab philosophers, he was only the head of many, and the Arabs alone at that time were the great translators of Greek works, which were mostly re-translated into Latin by the Jews, and thus only were Greek works known to Europe, until the revival of Greek in Italy at the end of the fourteenth and the beginning of the fifteenth century. Gemistos Plethon, who was one of the great teachers of Greek in Italy, only died in 1450, and his body now rests in one of the niches in the temple to Isotta at Rimini. It was brought from the Morea by Pandolfo Malatesta.

To surpass the ephemeral architecture of the Saracens was, in my opinion, the aim of the Gothic architects, and I think the lessons the Saracens gave them of producing magical effects by the endless combination and repetition of a few simple forms was not lost on them.

In my third lecture I told you how much the stepped canopies on the centre gable of the portal at Reims were like Saracen stalactite work. Some of the late vaulting at Oxford Cathedral strikes any one familar with Saracen work as being very Saracenic in appearance, and quite Saracenic in principle; while many lattices and similar patterns might be taken for either Gothic or Saracenic. The Christians, we are thankful to say, were not debarred from the representation of man or beast, and therefore, were not driven, like the Saracens, to wholly devote themselves to forming ornament out of geometrical patterns and a few flowers.

It is most agreeable to find a shoemaker, a baker, or a sword cutler that you go to, conversant with the history and archæology of his trade, and you think him a praiseworthy person if he knows these things, and is a good tradesman as well, but if he gives you shoes that wring your feet, heavy or gritty bread, or an untempered sword, you wish he had spent the time he devoted to archæology in learning his trade.

Architecture makes so many and such varied demands on a man's time that if he be an architectural archæologist as well he is a phenix.

It must, therefore, strike every one that what an architect first wants to learn are those things that form the very foundation of structural knowledge. That an acquaintance with the forms that were agreeable to nations hundreds or thousands of years ago, can at the best be but agreeable information; unless, indeed, architects are so enamoured of the present taste, as to desire to keep a shop for fancy dress architecture. The so-called Renaissance architects were, as a rule, wholly ignorant of the very foundation and aims of architecture, that of meeting wants in the best and most economic way, of adorning such parts as require adornment with elegantly designed mould-

* Being the fifth Royal Academy Lecture on Architecture this session. Delivered on the 8th ult. by Professor Aitchison, A.R.A.

ngs, that tell the tale proper to the building in the climate it is built in. How could men who were goldsmiths, sculptors, painters, or literary men, who knew absolutely nothing of the art of constructing, or of the strength and qualities of materials, and whose aim was solely to make a building look something like what they knew of a Roman building, be real architects. A few of the great geniuses picked up a little superficial knowledge of construction. The Renaissance architects ought to have been at their very best in the great cathedral of the world, St. Peter's. What did they do? I think they made the biggest one, but it was a badly-constructed artistic failure, with about ten times the material a Gothic architect would have required.

Greek architecture, Roman architecture, and Gothic architecture are dead; but, like the discreet statesman, they do not wish it to be known. What is not dead but only sleeping is the method that the barbarians began and continued until at last they became the most skilful builders in stone the world has yet seen. They keenly observed, they accurately deduced, they dared and strove; if a wall tumbled down, they set themselves to find out why. Was it a bad foundation, bad stone, bad mortar, or bad workmanship? Or was it insufficient to resist the pressure of the wind? And they did the work over and over again, correcting one or more of the faults they had discovered until it stood; they mostly had near them Roman or Byzantine buildings that had groined vaults, or learnt the art of vaulting from Byzantine builders, and they used these vaults in the narrow aisles of their churches, and roofed the wide naves with wood. These roofs were burnt over and over again by lightning or otherwise, so they tried to vault them in stone. These vaults fell down and partly or wholly destroyed the building. They then tried counterforts and ties without avail, and then they tried binding the whole together with timbers built in the walls; but these rotted and the vault fell again. They noticed that the flat part at the top of the vault was the first to go, so they gradually made them pointed, and eventually found that groined vaults over clearstories could be safely abutted by flying buttresses which carried the thrust into the ground. I should say that they were always short of money, and so had to study the greatest economy. While they were making these experiments the Abbey schools were teaching their scholars some of the necessary elements —geometry and drawing, the use of the tools for their respective crafts and giving them probably the best information about building that could be got in the civilised world. Towards the end of the twelfth century the architects formed themselves into a trade guild. We must believe that they were then pretty sure of having solved all the main difficulties, but they did not rest and be thankful, but strove to their utmost to improve what had gone before, not always, perhaps, to our satisfaction, but, structurally speaking, they became more and more skilful, and artistically, more and more elaborate and wonderful.

If any one will take the trouble of following the style out from the first ignorance and blundering of the uncivilised barbarians, he will be kept, like they were, in breathless expectancy as to the result of the experiment, although from our greater knowledge we feel sure that the experiment must fail, and when they had mastered the great problems, or as I might say made their wonderful discoveries, we can see the great care that was taken to think out every problem, and to solve it properly, for each step was new. We are struck with their readiness of resource, and with the justness of their previsions.

The difficulties involved in counteracting opposing thrusts of various intensities were very great; and to get all these thrusts to neutralise one another, and to become vertical, was wonderful, but it had to be attained when all these counteracting thrusts were to meet on the top of a slender shaft. There is a central shaft in one of the chapels at Lincoln, I should guess the height of the pillar at 24 ft., and it is 18 in. each way on plan, and hollowed out like a Maltese Cross, and this pier bears the transverse and diagonal ribs of the chapel which is about 40 ft. by 30 ft., the shaft being of polished Purbeck, and it seemed to be upright. We all know how much out of the perpendicular the shafts in the Temple Church of London are. It is in cathedrals or large churches with high naves and clearstories, where forethought and care is most apparent; *e.g.*, where there are attached columns or piers in small stones that are opposite to monolithic columns which bear the transverse ribs of the vault, so that it was necessary to provide for the squeezing of the numerous joints on one side, while the monoliths on the other side would not squeeze. Similar lessons may be learnt by observing the flying buttresses of small stones corbelled out, and the false bearings to get the sum of the thrusts vertical.

You must, I think, allow that these architects were most skilful.

What would we not give to know the architectural education they received?

I am by no means sure that if by the wave of a magician's wand, thorough knowledge of construction could be given to every student, that the succeeding generation of architects would be able to make buildings that would outrival the Gothic achievements; but architects must have this knowledge to do so, and besides this, it is attainable. The present generation would not learn it in the same slow and extravagant way that the Romanesque and Gothic architects did, they would learn it by mastering statics and the strength of materials in the first place, and by observation and experience they would perfect their theoretical knowledge, and this being done, no one can reasonably doubt that the architects of that generation could exceed in their buildings the height and slenderness of the spire of Strasbourg, or the lantern of St. Ouen; but beside that, it is a scandal that architects should not learn the very foundation of their art, and we must, too, recollect that we have materials in the shape of iron and steel, that are ten times as strong as any material known to the Gothic architects. The hardest granite will crush with 5 tons on the square inch, while cast iron will bear 44 tons. We cannot for a moment believe that if the Gothic architects had possessed such materials they would not have used them. We know that they sought out and found, wherever they worked, the stone most adapted to their purpose; they used soft, fine-grained stone for internal carved work, hard stone for corbels, lintels, &c., and for all places where stiffness was necessary, for instance when they wanted small isolated shafts, they cut them out of hard strata against the bed, and, in England, for the larger but relatively slender shafts they got the material from Purbeck or from the Derbyshire beds of black encrinital marble; for one of their objects was to make the piers as small as possible so as not to interfere with the circulation.

The great problems the Gothic architects had to solve were to ceil their buildings with stone, to remove all the solid parts of the walls so as to have the building all window, except at the buttresses, and in solving this problem they wanted a stone framework to their enormous windows to prevent the lead lights being blown in. They wanted to make the naves of their churches as high as possible, and to build towers of the greatest altitude; and in solving all these constructive problems they also wanted their buildings to be as beautiful as possible, according to the taste of the time. These problems are the same that we have to solve, and we can solve most of them structurally in a different way; for example, we can get a span by means of iron girders or trusses, so enormously greater than any span we are likely to want, that that difficulty may be said to have been removed. We can use iron columns of a height and slenderness that would dwarf the choir of Beauvais to a cell; but, at present, we have no idea of how to make anything we do beautiful according to the taste of the day, for this excellent reason, that there is no taste and no desire for beauty in any form. It is a utilitarian age, eager for wealth; but when it has got wealth, having no idea of using it in any noble way, but simply in sensual enjoyments. I noticed in some of the addresses of new M.P.s, that they aimed at destroying the last popular surviving visual fine art, painting, as many of them before have tried to destroy architecture. Who will collect pictures if they are to be heavily taxed on going to their owner's successors? Who will build magnificent mansions if they are to be taxed on their cost? The poor, ignorant creatures have not discernment enough to see that the mere building of a magnificent mansion employs thousands of people of every condition, many hundreds of whom are engaged in trades that give scope for their intelligence, invention, and skill, from the meanest bricklayer to the cabinet-maker, the carver, the modeller, and the architect; and leave a work to delight posterity, and to be a perpetual record of the intelligence, skill, and glory of the country. I presume that those who would tax painting would also tax sculpture, so that no visual fine art should exist to charm posterity, and to convey to the distant future a picture of the highest qualities of the day. Do they want to leave no memorials of England behind them but broken beer-bottles, and the lobster-tins whose contents have been eaten to provoke thirst?

"Invention," says Sir Joshua Reynolds, "is one of the great marks of genius; but if we consult experience, we shall find that it is by being conversant with the inventions of others, that we learn to invent; as, by reading the thoughts of others we learn to think;" and where will architects find more invention than in Gothic architecture?

There is constructive invention and æsthetic invention, and we urgently want both; and in the labours of the Gothic architects these are both combined. You see, not only how they thought and reasoned, and strove to meet the structural difficulties that beset them, but how at the same time they brought their new constructive inventions into the pale of art. The flying buttress, perhaps the greatest, but certainly one of their greatest inventions, was purely structural, and was at first solved in a purely structural way. It was at first a mere plain arch or part of an arch, and it was not put exactly in the right place for nearly a century. Many of the cathedrals were obliged to have their early flying buttresses shifted at a later period. The architects of those days were not satisfied with a mere piece of building, put side by side with the elaborate decoration of the rest of their buildings, but turned their flying buttresses into decorative features, and made them, too, only strong enough to do their work when they were new. The effects of the weather have in many cases so weakened them that they have now to be replaced, as the thrusts of the vaults they abutted were threatening ruin to the structure. I strongly recommend you to study the flying buttresses of St. Urbain at Troyes. The Gothic vault was another purely structural invention, but the architects gradually inserted more ribs to make these vaults more conducive to effect. You may see how effective they are in Westminster Abbey. At last the ribs made stars and other patterns. The stone framework, or stone sashes of windows, was another purely structural invention, to prevent the lead lights being blown in, and these went through immense changes, from the early geometrical patterns to the last flamboyant. You all know what is sometimes called the leaf window, a rose window, in the south transept of Lincoln. Flamboyant is mostly seen in France, and the patterns are always ingenious, and sometimes beautiful; but they mostly have one, if not two, grand faults when looked at as part of the decoration of the front or sides; the tracery is too thin and the patterns are too small, so that, at the distance, they are seen to take in the whole front or bay. They do not compose with the rest. Their other fault is that they look as if they moved—a distressing fault at all times and in all ornament. Still, in spite of these drawbacks, they are most wonderful instances of human ingenuity in the pattern, and of skill in the execution.

To know the strivings and inventions of the Gothic architects, I cannot recommend a better nor more fascinating book than Viollet-le-Duc's "Dictionnaire Raisonné," for it is more interesting than half the novels, and is, too, most charmingly illustrated. I must warn you, however, not to believe in every word of it, as if it were Gospel truth, for some of the statements are absolutely incorrect. He was, too, so brilliant a theorist that he was inclined to found theories on very slight and insufficient grounds; but, above all, I must warn you against this error; he was so interested and absorbed in the efforts of the Romanesque and Gothic architects to get all their rules by observation and experience that he always depreciated the science of building. As the science of building is founded on experiments, and the fundamental laws that have been tested, it puts into the hand of youth a weapon of incomparable temper:—

> "As Balen's spear through Launcelot's shield
> Clove as a ploughshare cleaves the field."

So does the spear of science pierce the armour of ignorance. Experience consists of but a few vague inferences, founded on a few doubtful facts, while the other is founded on numerous exact experiments, from which the law is deduced. I by no means want to decry experience, as it gives us information of the working of causes, inseparable from actual work, that do not exist in scientific experiments. At Amiens we see that the piers that support the triumphal arches have been pushed outwards by the thrust of these arches and the vaults above, and inwards by the thrust of those of the aisles, &c., so you see that experience is

sometimes at fault! Every architect, before he is fit to practise, ought to know what weight the ground he builds on will bear on the square foot, what his walls and their loads weigh, and what force of wind will overturn them, the sizes wanted to resist the pressure of earth and water; the proper thickness of arches of different heights and spans, and what their thrusts will be when weighted, and the same of various vaults including domes. He wants to know what square and round pillars will bear, according to their height and diameter, and the various sorts of wood, brick, stone, iron, and steel, of which they are composed; what beams of various materials will bear in cross strain, the strains on trusses, &c.; yet, until the classes of the Architectural Association were started, all this knowledge was supposed to come by nature, if a man could draw the human figure or sketch in perspective.

To become a beautiful architectural draughtsman is a difficult art, but it does not make a man a designer, and to be an excellent designer and a beautiful draughtsman as well, does not make a man an architect. Yet, to make a man a good draughtsman, and to try and make him a designer, is all that has hitherto been taught since Renaissance days.

My most ardent desire is to see architecture brought to life again, and become a progressive art, as it was in Gothic times, and, being an Englishman, with English weaknesses, I should like English architecture to take the lead; but it never can be brought to life unless we go the right way about it. Plato tells us that Perikles wanted his son to be a statesman, and gave him the best education he could, and he so far succeeded that his son could ride on two horses, but he never became a statesman; that seems to be the modern method of teaching architecture. The architect is to know everything but his business.

The Gothic architects used every power of mind they had, and persevered till the thing they aimed at was done. Men are made valuable to themselves and others by determination, perseverance, and assiduity, and by using their brains, and striving, and whatever may be your difficulties—and I know they are so numerous as to be appalling—don't be cowed by them. If you will consider the difficulties that the Romanesque and early Gothic architects were surrounded with, you will not despair. If there is no one to teach you, teach yourselves; "self-taught is well taught." I feel confident that if each of you will do his best, we shall get out of the wood at last; and, mind you, it is a noble task—the noblest task an architect can set himself. Never copy. Be sure that he who stole his brooms ready-made never becomes a good broom-maker; and, once having determined to undertake the task, be not deterred by poverty, neglect, insult, or contempt. The task, once fairly started on, will attract others, and in the long run it will prevail. Let me give you my good wishes, that God may speed you in your task.

[The sixth and concluding lecture of this series will be given, not in our next issue, but in that of March 20, as we shall not have space for it in that of March 13.]

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE EDUCATIONAL TRAINING OF ARCHITECTS.

A SPECIAL general meeting of this Institute was held at No. 9, Conduit-street, W., on Monday (Professor Aitchison, A.R.A., President, in the chair), for the purpose of electing the Royal Gold Medallist for the current year.

The Chairman moved, and it was unanimously agreed, "That, subject to her Majesty's gracious sanction, the Royal Gold Medal for the promotion of architecture be presented this year to Mynheer P. J. H. Cuypers (hon. corr. member) for his executed works as an architect."

The ninth general meeting (business) was then held, when the following candidates for membership were elected:—

As *Fellows:* H. C. Charlewood, Newcastle-on-Tyne; J. G. Sankey, M.A. Cantab, Blackley, Manchester; and J. D. Mould, Manchester.

As *Associates:* H. W. Bird, Hong Kong, China; C. F. Innocent, Sheffield; A. E. Corbett, London; S. P. Rees, London; C. H. Dorman, Northampton; A. G. Bond, B.A. Oxon., London; G. W. Fraser, Bootle, Liverpool; Delmé G. Mootham, London; C. O. Nelson, London; R. C. Austin, Harrow-on-the-Hill; H. G. Fisher, London and Northampton; and C. S. F. Palmer, Sittingbourne.

Mr. Owen Fleming then moved: "That it be referred to the Science Standing Committee to consider the desirability of formulating a definite standard size for bricks." Such a recommendation, if carried, might be found to obviate many difficulties met with in practice in building.

The Honorary Secretary, Mr. W. Emerson, formally moved that the proposal be referred to the Science Committee.

Mr. Cooper seconded, and the motion was agreed to.

Mr. William Woodward referred to the subject of the new conditions of contract, and quoted letters from the Master Builders' Association and others to prove that builders would not sign them, and therefore the old conditions should be reverted to.

The Honorary Secretary replied that, at all events, 3,000 copies of the new conditions had been sold by the Institute.

The Chairman then called upon Mr. John Slater to read a paper by Mr. Leopold Eidlitz entitled "The Educational Training of Architects."

Mr. Slater, before reading the paper, said that a few days ago he had received a communication from the Vice-President, Mr. Graham, saying he would be much obliged if he, Mr. Slater, would read the paper by Mr. Eidlitz. The paper was characteristic and essentially American. The Americans were strictly utilitarian people. They had rather a contempt for tradition and traditional usage and they had adopted methods of their own with regard to building, and he was bound to say that with a great deal of what was in the paper he could not personally agree. Mr. Eidlitz was an architect, he believed, practising in New York, and he was the author of a book which was published some years ago, and which was in the Institute Library, on the "Nature and Functions of Art." He (the speaker) had only been able just to glance at this book; it was rather a large one and contained a great deal, no doubt, which was very suggestive, and there were points in this paper which themselves were very suggestive; but when an architect asked people to throw over tradition altogether, and believed that the study of old work was of very little use to the architectural student, and to be put off till after his student days, he was afraid a great many people in England would hardly agree with him. The main point that Mr. Eidlitz seemed to make was that form in architecture should always be connected with a proper relation of points of support to the strain of weights that they had to carry. No doubt there was a great truth in this statement, and he remembered very well that some years ago his friend Mr. Statham read a paper before the Royal Institution in which he very happily commented upon the lack of this element in construction with reference to one of our bridges, where there was a huge projecting pier, of which he (the speaker) thought Mr. Statham gave a diagram, supporting a young lady with a parasol.* No doubt there was a great truth in the fact that their points of support ought to be correlated to the weights they had to bear, and his own opinion was that the disappointing feature of American architecture was very largely due to the fact that these huge, lofty buildings which were erected in the States were constructed solely of iron, the iron supports were cased with stone to look like stone piers, and they had a building of thirteen or fourteen stories high which apparently rested upon a stone pier, which it was perfectly evident was not sufficient to carry it. Now, he did hold most strongly that the supports of a building ought not only to be actually but apparently proportional to the weights they had to carry, or we should not get any pleasure from the aspect of the building which we looked at; but he was afraid if we were to adopt, as the text-book of our architectural studies, or our architectural education, the mere mechanical formulæ of proportion of weight to strains we should not clothe the dead bones of buildings with any architectural life at all.

Mr. Slater then read the paper by Mr. Eidlitz, in which, after a few preparatory remarks, it was observed that up to the thirteenth century architects were builders who arrived at progressive methods of construction mainly by practical experiment, the results of which were stored up as rules-of-thumb by guilds and individuals, and modelling and decoration were mainly matters of feeling. During the last century the science of mechanics had been developed, which enabled us to compute with precision the strains caused in all combinations of matter which had served or might serve to form constructional elements. A certain distribution of weights being given to be sustained between two points of support, we knew what was the line of pressure caused by those weights, hence what was the form of arch to sustain them with the least amount of material. We could compute the transverse strength of a beam or a lintel, the bending moment of a pillar, or the deflection of either, under loads so small that it could not be measured. We were all ready to admit that this knowledge was useful, but many of us doubted that it had anything to do with architecture as a fine art. But in architecture, harmony of form could be attained only by a strict observance of the mathematical relation of strains. Harmony of strain meant that stress should be always resisted by a proportionate amount of material, no more, no less. This did not mean that there should be no more material used than was absolutely necessary to perform a given amount of mechanical work, such, for instance, as we considered proper in economic structures, factories, warehouses, tenements, &c.; but whatever the amount of material to be used in a given architectural monument, which, in the opinion of the architect, was commensurate to its character of stability, dignity, and elegance, should be proportionate to actual strains throughout the whole design. To be explicit, each building material sustained a certain amount of strain at the breaking point. The actual strain permitted in any structure in practice was but a fraction of the ultimate strain of the material at the breaking point. This fraction was known as the factor of safety, and should, for the same material, vary in different buildings in accordance with their dignity. The architect might use one factor of safety for a school-house, another for a library, and yet another for a church. The factor of safety so chosen became the key-note of his design, and a constant reference to it insured harmony. Factors of safety varied with the different materials, and more or less depended on limits of elasticity, methods of construction, probable effects of the weather, corrosion, &c. Strain was the sum of weight, its direction, and resulting bending moments. The greater the ultimate resistance of the material the greater the admissible maximum strain, hence the more elegant the structural forms. In the use of modern rolled iron, form became attenuated far beyond the limits of the forms the architect was familiar with. Mr. Ruskin said, "There is no law, no principle based upon past practice, which may not be overthrown in a moment by the arising of a *new condition* or the invention of a *new material*." But there was still the law of mechanics, which could not be overthrown by new conditions or new materials. An example of gross discord was in an existing building (diagram shown) where there were granite columns of the same apparent size, five of them supporting a portico 35 ft. high, and two carrying a wall 300 ft. high. The shafts of the two latter, moreover, consisted of two pieces vertically joined. These two columns carried a load of 480,000 lbs. each, the five similar columns only 40,000 lbs. each. But the two columns with the heavier load concealed iron posts, which the architect had enclosed in pieces of granite to convert them into a form of support known to him in Greek and Renaissance architecture. If the architect did not like the appearance of the iron, a granite column proportioned to the load was perfectly practicable. No new style of architecture could be expected when new conditions and a new material, such as steel, were referred to the Greek portico, instead of to the law of gravitation. The constant study of architectural history was a great stumbling-block to the student of architecture in this respect. The system of the École des Beaux-Arts, which was imitated in many schools outside of France, was utterly subversive of possible logical architecture. Students were required to prepare sketches, often of important architectural monuments, in from six to sixteen hours. Criticism of these designs by teachers admitted transgression against good construction as comparatively pardonable, but insisted on observance of traditional treatment of form as imperative. The study of architectural history should be postponed for a post-graduate course, or should be left for private reading after the academic course was completed. A future text-book of architecture for universities, polytechnic schools, and academies of the art of architecture would doubtless bear the title "The Theory, Practice, and Art of Building." This text-book would assume the student to have attained a mathematical training sufficient to read with comfort and refer to with ease, say Rankine's

* There was "no lady in the case," the column was shown as supporting only a small balcony. It was the granite column on a pier of Blackfriars Bridge.—ED.

"Applied Mechanics," or any other work equivalent to it, at least, as far as statics were concerned. It would contain essays on the subject of modelling (moulding) structural parts, with reference to mechanical work done and the strength and elegance with which it was to be done, when considered in connexion with the dignity of various buildings, and how modelling was affected by the nature of the material used. Also an essay on carved ornament and colour-decoration, and their relation to mechanical function, the character of the structure, and the nature of the material used. All this would be illustrated with diagrams and decorative designs, selected from existing sources, composed anew from natural objects, conventionalised in accordance with the nature of the material. Then there would follow the architectural scales, which, like the scales in music, would serve to train the student preparatory to the work of actual composition. What was meant by architectural scales might be best illustrated by one or more examples, for instance:—Given a pillar of a certain length, and the load it supported in pounds, what would be its sectional area, and what its form, modelling, carved ornament, and colour decoration (if any) in a warehouse, a public school, a library, a court-house, and a parish church, when the pillar was made of wood, cast-iron, wrought-iron, bronze, brick, sandstone, marble, or granite? The text-book would answer these questions, and illustrate the answers by drawings and diagrams. Assuming the architectural scales to comprise the first part of the text-book, the second part would treat of the construction of single cells, and the combination of these into piles. Monuments thus conceived and designed would be expressive of their meaning and the individuality of their author, they would be harmonious in themselves, and would vary from the forms of the past in the degree as new wants, new material, new methods of construction varied from those handed down to us in history. At present architecture alone, of all human pursuits, retained obsolete forms and neglected underlying principles and organic laws. It must be remembered, however, that this was not the case prior to the fourteenth century. A period of one generation was quite sufficient to initiate renewed rapid progress in architectural art, provided that we were willing to refer it to its true and fundamental principles, and to teach it rationally.

Mr. H. H. Statham said be should be happy to propose a vote of thanks to Mr. Eidlitz for his paper. He had listened to this short paper with a mingled feeling of interest and something of melancholy, as to the latest attempt to found a new and perfect theory for evolving a new style of architecture. There were some valuable suggestions in it, but he feared they would not come to any practical result. What was of some value was the suggestion for an "architectural scale" for giving pupils a problem of this kind: Given a pier, of a certain length, and given the weight it supports, what should be its sectional area and its width? They could go as far as that. Then the author went on to say: "What should be its moulding and its carved ornament?" And that, it appeared to him, had nothing to do with its practical power of strain at all. The paper repeated the old fallacy, that we should endeavour to carry out architecture as people carried it out before the fourteenth century, without any reference to precedent. He wished people could once for all recognise the fact that that was absolutely impossible. We were not in the position of people before the ages of printing. The people who built the fourteenth century cathedrals, the people who evolved Gothic out of round-arch Gothic, worked in a spontaneous way and without reference to other styles, simply because they knew of nothing else; they did not travel much, and were unacquainted with other places. Now we had before us in books, photographs, and by travel, a knowledge of everything in other countries, and of everything that went before us. Even the Romans had no real knowledge of Greek architecture. Vitruvius wrote about Greek architecture, but it was improbable that he had ever visited Athens. That idea that we could ever practise architecture as it was practised before the era of printing was an illusion, and the sooner it was dropped the better. Some hard things had been said in this paper about the system of the École des Beaux-Arts, which was said to be subversive of true architectural training. He thought the system rather conventional; but, nevertheless, the late Mr. P. G. Hamerton, one of our ablest and most thoughtful modern art critics, who spent a good many years in France, left it on record as his decided conviction that there was more living architecture in France at this moment than in any other country in the world; and Hamerton, it must be remembered, was not an architect, and as a critic he was singularly independent and original in his views, and therefore his opinion was of some value. For some years back he (the speaker) had looked annually through the architectural designs at the Salon, and from the original character of some of the designs, as well as of some of the new buildings in and around Paris, he was convinced that the teaching given in the École des Beaux-Arts had not produced such ill results as was supposed. The Gold Medal for Architecture of the Salon last year was awarded to M. Scellier de Gisors for a set of drawings for the new central depôt of the Post and Telegraph Office—an eminently practical treatment of a purely technical building, with nothing academical about it. Therefore he did not share the misgivings of Mr. Eidlitz as to the unhappy results of the teaching of the École des Beaux-Arts. He agreed with him that it was a great advantage to students to direct their minds to the consideration of the stresses in the buildings they designed, and to design in relation to that; but he did not think that it was of any use to try to shut them out from any architectural precedents, because if they were kept from all books and knowledge of architectural history they will have nothing to go upon as a basis for designing at all; and no one generation of men can absolutely originate a style.

Mr. Emerson said he had much pleasure in seconding the vote of thanks. He thought the teaching of the École des Beaux-Arts, which was essentially that of classical architecture, was really subversive of the architectural problem that Mr. Eidlitz wished to work out, which was a problem of constructing an architectural building of, say, from fifteen to twenty-two stories high. Such a building in America naturally meant a construction of steel or iron, which was an architecture that we ought to study at the present time. In Mr. Cates's absence he would read some remarks written out by him:—

Mr. Cates, in his communication, said that the educational training of architects, with which the Institute was concerned, aimed at fitting the student for the acquisition of the knowledge necessary for the satisfactory practice of his profession in developing his natural artistic and scientific ability, so that he might apply both to the expression of his ideas in design and in the realisation of his conceptions. In the complex conditions of the practice of the day the architect must aim at acquiring the power to attain success in designing buildings which should be convenient and appropriate in arrangement; of stable construction, and of suitable and beautiful design. The first studies of the aspirant should be devoted to a mastery of Classic and Mediæval work—intelligently studied, with a thorough acquaintance with form and detail—leaving the Renaissance and later developments to a subsequent period, when he could bring to bear on their consideration the knowledge acquired in the first years of his studies. In both periods the sedulous cultivation of the art of accurate and effective delineation, and of sketching detail and ornament, from buildings and from memory, thus bringing eye and hand and brain into harmonious and mutual action, was of the highest importance. Concurrently with this, the study of the history of the several periods of architectural art was of the greatest value, not as a mere matter of dates and names, but as giving life and interest to the subjects studied, connecting them with the actual social life of the people by whom they were evolved, and with the political, social, and religious influences which controlled their design. It had been well said by Professor Ware:—"If ever you have a new idea, however slight and unimportant it may seem to be, cling to it, cherish it, develop it, and some day you may awaken and find yourself immortal." This immortality was not likely to be attained by the study of the suggested "future text book of the theory, practice, and art of building." The "factor of safety," which it appeared might vary in different buildings, in accordance with their dignity, was apparently the key to this "text book;" but surely the first elements of design dictated that the considerations of form, outline, masses, and stability, in both appearance and fact, must be the essentials to be primarily dealt with, and these, as well as the character of the detail and of the ornament, must be governed by the nature of the material to be employed. The skill and talent of the architect was displayed in his artistic and scientific use of such materials, in accordance with their qualities, and in their application to the best advantage for convenience, strength, and beauty. No "text book," no "architectural scales," no "combination of single cells into piles" would enable the architect to effect this. His success would depend on his application of the capabilities of the materials he used, and would be the greater as he might have been blessed with the divine inspiration of artistic genius, and have cultivated and developed it by earnest study, of which mechanical and constructive details would not have occupied the most important part.

Mr. William Woodward said he wished to confine himself to one practical point in this subject. Mr. Slater said that not only should the column or pier carry the superstructure, but it should appear to carry it. In other words that, supposing with a cast-iron stanchion encased in stone they can carry the superstructure with a diameter of 2 ft. 6 in., Mr. Slater's theory carried into practice would mean, speaking roughly, a pier or column 5 ft. in diameter. That, in the case of a commercial building, would, of course, be a pier which would not be tolerated by the person who had to pay for the building. To his mind it was a perfectly defensible proposition that an architect should take advantage of a cast-iron stanchion, and enclose it with terra-cotta or stone, and thereby reduce the diameter of that column. So long as that column was in proportion, to his mind it was quite a defensible design.

The Chairman said that some seven or eight years ago he happened to pick up Mr. Eidlitz's book on "The Nature and Function of Art, more especially of Architecture," at an old book shop, and was struck by its title. He read it through (no small task, he might say, for it was rather a large book), and found the author was the only person he had ever come across who had a due belief in the importance of art to mankind. He had spoken to a great many artists at various times, but they almost all agreed in the modern maxim that art was solely for delight. Now, Mr. Eidlitz was certainly of opinion that it is one of the great means of education of the masses, that the sort of vague ideas that they got from it were the only ones that they could possibly get; and, as he said, at present it was thought that we could do without art. But it was just as necessary now if they wanted to teach the people as it was two thousand years ago. Well, that alone was a great charm in the book. He could not say that he wholly and entirely agreed with all his remarks about architecture, and, amongst other things, he did not agree with his idea that the whole scheme of architecture can be changed in a generation, or anything like it; but he considered that the paper they had heard was one of the most important papers ever read in that Institute since he had been a member. They knew that one of the great difficulties of architecture was proportion. Now, the proportions of parts originally laid down by the early builders were based on the strength of materials as their experience taught them to use them. He had not the least doubt of that, although he could not prove it. Well, these proportions had now come from study and from their being constantly before us to take a form that was agreeable to our eyes—custom would do that. Mr. Eidlitz had, in his opinion, made architecture take one step forward. He said that you would find that if you took a constant, according to the desired appearance of a building, and multiplied by that constant every portion, first calculated for its absolute stability, you would get a proper proportion without any more trouble; and that, in his opinion, was a true as well as a most valuable remark. Mr. Statham's remarks about the effect of things past on the minds of the present generation were certainly perfectly true. He did not think there was anything in Mr. Eidlitz's paper that at all went to show that he was of a different opinion. He agreed with Mr. Eidlitz's remarks about the usual study in own country of what was called historic architecture. As applied now it was perfectly useless, and not only useless but very destructive of any kind of progress, for, as Mr. Ruskin said, studies of old buildings are not to be put into a store-house for use, but into a gallery for study. The thing that we wanted to do, in his opinion, was to express in the taste of the day the things that were wanted. We wanted to arrange a building as exactly as was possible for its purpose; we wanted to make it bear what it should bear in each portion of it, and to give it the ornament which was necessary to convey to persons of our own day an idea of the use to which that building was put, and to evoke the proper emotions, and all these things were more or less embodied in Mr. Eidlitz's paper. But there was

one point with which he could not agree, viz., that not only the rough form, but the absolutely finished form, could be got at by the consideration of strains. That he did not think was the case. Architecture appealed to emotions which no mechanical methods could produce. The only thing he would say about Mr. Statham's remarks was that the Roman architects, and even the earlier Romanesques, were not so absolutely without anything to give them an idea. There then were in most places the Roman ruins. There were the works of the Byzantines; and the Romans themselves, they must recollect, when they became great builders, had conquered all the civilised world—all the whole of the countries round the Mediterranean were portions of the Roman Empire—and therefore they had had a great opportunity of seeing the native architecture of those places. And so the Romanesque architects learnt the little they could from the Roman and Byzantine buildings around them, and what they did then was nothing to what they afterwards accomplished when they had made a tour through Europe, Asia Minor, and Syria; and they must recollect that it was not till 1291 that the Crusaders were eventually driven out of Acre. These people had not only a fine opportunity of seeing a great many things that had been done, but they were also in contact, as well as in conflict, with those people who were then the most civilised in the world—the Saracens. They must have seen an immense quantity of their rather ephemeral works, and he believed it was the endeavour to rival, rather than to imitate them, which gave the peculiar character which Gothic, and especially late Gothic, took.

The Chairman announced that the next meeting would be held on the 15th inst., when Mr. W. H. St. John Hope, M.A., F.S.A., would read a paper on "Heraldry in English Mediæval Architecture."

The meeting then terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday, Sir Arthur Arnold, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Battersea Vestry 13,900*l.* for the purchase of the freehold of premises for an electric lighting station; the Hampstead Vestry 8,380*l.* towards the cost of the High-street improvement; the Westminster Vestry 12,400*l.* for local street improvements; the St. George's, Southwark, Vestry 1,650*l.* for the erection of a shelter for persons whose houses are being disinfected; and the Hackney Guardians 19,550*l.* for the erection of casual wards, infirmary, &c.

North Woolwich Drainage.—The Works Committee reported as follows:—

"We have considered the estimate, amounting to 48,000*l.*, and specification submitted for the drainage works at North Woolwich. It has been reported to us that since the estimate was prepared by the Main Drainage Committee on October 1, 1896, the cost of bricks, ironwork, and other materials has considerably increased. We have therefore to report that we are satisfied with the amount of the estimate of 48,000*l.*, subject to an allowance of 1,000*l.*, due to the increased value of materials since the estimate was prepared."

Charges for Water Supply.—The same Committee also reported as follows:—

"We have to report that the following charges have been made for the supply of water at the Lewisham Sewer Works in the districts served by the undermentioned companies:—Kent Waterworks Company, 10d. per thousand gallons, after 84,000 gallons have been supplied; 4*l.* for the use of each meter, which includes the supply of 84,000 gallons of water. Lambeth Waterworks Company, 1s. per thousand gallons, and 10s. 6d. per quarter for the use of each meter. We have endeavoured to obtain a reduction of the charges of the Lambeth Waterworks Company, but without success. We have been informed that an estimate, amounting to 6d. per thousand gallons, has been obtained from the same company for the supply of water for the Lambeth Baths which are situated in a district also served by the Southwark and Vauxhall Water Company. We report these facts for the information of the Council."

Fleet-street Widening.—The report of the Improvements Committee contained the following paragraph, the consideration of which was adjourned for a week:—

"We have had before us a letter from the City Commissioners of Sewers stating that they propose, with a view to continuing the widening of Fleet-street, to acquire the freeholds of the properties between Bride-lane and Salisbury-court (Nos. 82 to 97, Fleet-street, but excluding No. 89, in respect of which the Council has already agreed to contribute), and asking the Council to contribute half the cost of the proposed improvement. The present width of the road is about 45 ft., and it is proposed to increase this to 60 ft., the cost of so doing being estimated at 170,780*l.*, but it is probable that that amount will be reduced, as the Commissioners propose, by acquiring the freeholds, to allow some of the short leases to run out. We may point out that the Council has already agreed to contribute half the cost of widening Fleet-street between Ludgate-circus and Bride-lane, and at No. 89, and that the Council, when so agreeing, had regard to the fact that the widening of Fleet-street is necessitated not by local but by general through traffic to and from all parts of the county, the street being one of the main thoroughfares of London. The present application is in respect of a proposed widening of the road for a length of about 216 ft. In March, 1896, when the Council agreed to contribute half the cost of widening the portion of Fleet-street between Ludgate-circus and Bride-lane, we made reference to the present proposal, and stated in our report that 'there would still remain two other portions of the street, between Salisbury-court and Temple Bar, having together a length of about 1,100 ft., which at some future time would require to be widened. It is, therefore, evident that the present improvement is only the commencement of a much larger scheme which, in its entirety, will doubtless cost something approaching a million pounds sterling. We must point out, however, that if the Council agree to contribute part of the cost of the improvement at present proposed, it will not necessarily be absolutely committed to contribute towards the cost of the larger scheme.' We may here mention that Ludgate Hill, which is a continuation of Fleet-street, has been widened to 60 ft., and that the late Metropolitan Board and the Council contributed to the cost of the work. We are strongly of opinion that to continue the widening of Fleet-street is a desirable work, and the Council having already admitted the necessity of the improvement, we have decided to recommend the Council to accede to the request of the Commissioners. We may state that the Commissioners have complied with the rules of the Council governing applications for contributions towards the cost of improvements, and we are advised that the estimated cost (170,780*l.*) is fair and reasonable. . . . . We have sent to the Finance Committee an estimate of the amount required, and we recommend—

'That the estimate of 85,390*l.* submitted by the Finance Committee be approved, and that the Council do contribute on the usual conditions one half of the net cost of widening Fleet-street betwe n Bride-lane and Salisbury-court (Nos. 82 to 97, Fleet-street, but excluding No. 89, in respect of which the Council has already agreed to contribute), as shown by a black line upon the plan submitted by the City Commissioners of Sewers, such contribution not to exceed the sum of 85,390*l.*

Hackney Wick and Isle of Dogs Relief Sewer.—The Main Drainage Committee reported as follows, the recommendation being agreed to:—

"On March 1, 1892, the Council accepted the tender of Messrs. E. & W. Iles, amounting to 36,600*l.*, for the construction of the Hackney Wick and Isle of Dogs relief sewer. The work was commenced in May, 1892, and completed in May, 1895. During the execution of the work great difficulties were met with in crossing the river Lee at Bromley, inasmuch as the trial borings on which the engineer's estimate and the contractors' tender were based proved to be unreliable when the ground was fully opened, and it was found necessary to deviate the line of sewer from that laid down in the contract. An entirely different method of constructing the sewer had to be adopted in place of that contemplated when the contract was let, and the navigation of the river Lee had to be interfered with, considerable additional expense being incurred thereby. Certain additions were also made to the work specified in connecting the sewer with the low-level sewer. The Engineer now informs us that the account rendered by Messrs. Iles amounts to 52,338*l.* 19s. 4d., and that the several claims made by them have been thoroughly inquired into by him, with the result that his award, subject to arithmetical checking by the Comptroller, amounts to 44,059. 10s. 5d., of which a sum of 33,700*l.* has already been paid, leaving a balance of 10,359*l.* 10s. 5d. To meet this expenditure there is a sum of 1,964*l.* 8s. available from the estimate adopted by the Council in respect of this work, and it becomes necessary for us therefore to ask the Council to pass an excess vote for the remainder, viz., 8,395*l.* 2s. 5d. We recommend—That the Council do sanction an additional expenditure of 8,395*l.* 2s. 5d. in respect of the construction of the Hackney Wick and Isle of Dogs relief sewer, and that, subject to its being checked by the Comptroller, Messrs. Iles' account be settled in accordance with the Engineer's award."

The Works Department.—The Works Department submitted a list of nine jobs, the estimate for which was 23,218*l.* 2s. 8d. and the actual cost 25,696*l.* 0s. 4d. Six other works, for which certificates had not been obtained, were reported to have cost 33,971*l.* 13s. 1d., as against the Managers' revised estimate of 32,030*l.* 5s. 6d. The consideration of the report was postponed for a week.

Re-naming of Streets, &c.—On the motion of Mr. Fox it was agreed (1) "That, in view of the congested state of the foot traffic in many parts of London, it be referred to the General Purposes Committee to consider whether a suggestion should not be made to the Commissioner of Police that notices be placed in the principal thoroughfares requesting pedestrians 'to keep to the right.' (2) That it be referred to the Building Act Committee to consider whether it should not be proposed to the Local Authorities in London that, in cases where streets are re-named, the original name be allowed to remain for at least twelve months after the date at which the new name shall have been affixed in the thoroughfare."

The Council adjourned, after an unusually short sitting, at 5.40 p.m.

THE PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.

The Annual Dinner of this Institution took place in the King's Hall, Holborn Restaurant, on the 27th ult., Mr. Benjamin J. Greenwood (Messrs. Holliday & Greenwood) occupying the chair. The company numbered 420.

The loyal toast having been honoured,

The Chairman proposed the toast of "The Architects and Surveyors," coupled with the name of Mr. G. D. Stevenson. The modern architect, he said, was a man of considerable ingenuity and talent, and in London, what with the law of ancient lights on the one hand and the regulations of the County Council on the other, much skill was requisite in surmounting the difficulties which occurred in the architect's professional life. For both architects and surveyors, builders' foremen and clerks of works felt much esteem.

Mr. Stevenson having briefly replied,

Mr. W. H. Sharpington proposed the toast of "Builders and Contractors" or "Builders and Contractors Proper," as he phrased it; and in the course of his remarks he spoke of the difficulties which builders, as well as architects, had to contend with in dealing with ancient lights, &c.

The Chairman, in response, said that those who were not builders and contractors proper were willing and anxious to secure contracts for buildings, but whenever they had occasion to erect a building for themselves they called in an outside contractor to do the work. The difficulties of architects in regard to ancient lights were shared to a large extent by builders, who had many troubles of a similar character to contend with.

Mr. John Beer, Hon. Sec., proposed "The Governors, Trustees, Donors, Honorary Subscribers, and Visitors," coupled with the name of Mr. R. Adams, who, in responding, urged all builders' foremen and clerks of works who were not already members of the Institution to join at once.

The toast of the evening, "The Provident Institution of Builders' Foremen and Clerks of Works" was then proposed by the Chairman. The Institution, he said, existed for the purpose of enabling builders' foremen and clerks of works to make provision for the future, and all men of commonsense made such provision; those who did not while they could were a nuisance. The Institution had, during the last fifty-six years, carefully disbursed no less a sum than 10,032*l.* to afflicted members, their widows, and orphans. He hoped that builders' foremen and clerks of works who were not already members of the Institution would join at once—to support it in the day of their prosperity and receive aid from it, if need be, in the day of adversity.

Mr. J. W. H. Bedford, in response, said that during the past year 306*l.* had been distributed to twenty pensioners.

Other toasts were "The Chairman," proposed by Mr. J. Stapleton; and "The Press," proposed by the Chairman and responded to by our representative.

During the evening a list of subscriptions for the coming year was read, the total exceeding 120*l.*, including 15 guineas from the Chairman.

HOME ARTS AND INDUSTRIES.—The third annual exhibition of this Association will be held at the Albert Hall, from May 20 to 24. The exhibits will include the work of the Princess of Wales's classes at Sandringham.

THE LONDON COUNTY COUNCIL INQUIRY.

THE special inquiry into the organisation of the Works Department of the London County Council was resumed at Spring-gardens on Wednesday, the 24th ult., when the taking of evidence was concluded.

The Committee had met for the purpose of cross-examining Mr. Ward on a supplementary statement he had put in for the purpose of controverting several points in the evidence of Mr. E. White, but, on being asked whether he had any verbal statement to make, Mr. Ward proceeded to make fresh allegations against the Architect's department. In this he was interrupted by the suggestion that before any fresh charges or counter charges were allowed to be made either by Mr. Ward or the Architect those two gentlemen should be brought together to confer, Sir Arthur Arnold offering his good offices to bring them together should there remain any difficulty in the matter.

Mr. Alderman Beachcroft said he had only one question to ask the witness. Was he not of opinion that there were faults on both sides?—Mr. Ward replied in the affirmative.

Mr. Ward, in his statement, denied the allegation of Mr. White that while on the Works Committee he had asked for information from time to time without being able to obtain any assistance from the Chairman or members of the Committee. Mr. White had never asked the witness any question to which he had not replied to the best of his ability, and both the Comptroller and the Clerk of the Committee had assured him that no question addressed to them by Mr. White had been left without answer. Mr. Ward further stated that the measurement up monthly of every work would have involved a further increase in the already large staff, and he had opposed Mr. White's proposition to that effect on that ground, and also on the ground that the manager could and did check the weekly prime cost returns in many instances. He admitted that the Committee should have had these returns since they were prescribed by Regulation No. 62, but neither he (the Chairman) nor the Clerk remembered the regulation, and nobody drew their attention to it. The witness accepted his share of the blame for not having remembered this part of the regulations. In reply to the accusation of Mr. White that he and Mr. McDougall had acted in an underhand way with regard to the contract for the Bexley Asylum work, the witness cited the letter he had sent to Mr. McDougall on the subject. In the letter Mr. McDougall was informed that the manager, in reply to the Chairman's request, made the night before, had just informed him that he estimated the value of the work at 94,787*l.*, the letter adding, "Please understand the figure has not been before the Works Committee, and is not for publication."

Mr. Fletcher, on this part of the statement, asked the witness: Does not that strike you as a rough way of dealing with a 100,000*l.* job?

Mr. Ward, in the statement, gave his version of the causes which led to his temporary resignation of the chair in February, 1896. The rejection of his report and the refusal of the Moderate majority to allow him to put in any defence of the Committee was the sole cause of his resignation. It had nothing to do with the "notice to workmen," which he had not opposed, and against which he had not used his casting vote when the numbers for and against were precisely equal. He contended that Mr. White's estimate of losses was greatly exaggerated. Mr. White took only account of losing jobs, refusing to take into account works on which a profit was shown. Mr. White had stated the loss on Colney Hatch at 6,000*l.*, but the actual excess of cost over the original estimate was only 5,500*l.*, against which ought to be set a sum of 4,212*l.*—namely, 2,900*l.* for extras, and 1,312*l.*, the difference between the price agreed upon by the Works Committee and the lowest tender received. The last part of the statement contradicted certain portions of the reply made by Mr. Blashill to the evidence of witnesses before the Committee. Mr. Blashill had complained of "gross unfairness" in the charges made against the character of the plumbing, assuming that all the samples were taken from old works. The witness now asserted that, on the contrary, most of the samples of bad plumbing exhibited were from comparatively modern constructions. On the subject of friction between the Departments, Mr. Ward expressed the opinion that the friction would probably cease to exist if they could always deal with Mr. Blashill direct, but loyalty to his subordinates had compelled and must continue to compel the Architect to accept the decisions of comparatively minor officials when the details were so excessively numerous and were spread over so large an area.

Sir Arthur Arnold, in announcing that no more evidence would be taken and that the Committee would now deliberate, stated that the doors would not be absolutely closed, as it was understood that the late manager (Mr. Holloway) was willing to give evidence on condition of being allowed to cross-examine. It is expected that the Committee of Inquiry will be prepared with its report before the end of the current month.

COMPETITIONS.

WESLEYAN CHURCH, BLOWICK, NEAR SOUTHPORT.—In a limited competition for the new Wesleyan Church at Blowick, near Southport, the designs of Messrs. Green & Brockbank, of Adelphi Bank Chambers, Liverpool, have been placed first, and accepted. The church will cost about 3,500*l.*, and will be built of brick with stone dressings.

NEW CHURCH FOR MILE END, ABERDEEN.—A meeting of the committee appointed to promote the movement for the erection of a new Free Church in the Mile End district, Aberdeen, was held on the 25th ult., when it was resolved to solicit designs for the church from local architects only, and to secure the services of an Edinburgh architect to act as assessor. It is intended that the building should be of granite, seated for 800, with hall accommodation for 400, the cost being estimated at about 6,000*l.*

PUBLIC BATHS, WALTHAMSTOW.—The award of the assessor appointed by the District Council, Mr. Rowland Plumbe, is as follows:—1st, "Hygiene," Mr. J. Williams Dunford, 100c, Queen Victoria-street, E.C.; 2nd, "Experience," Messrs. Spalding & Cross. The District Council have appointed Mr. Dunford their architect, subject to his plans being approved by the Local Government Board.

ASYLUM, RAUCEBY.—This was a competition for a new asylum at Rauceby, near Sleaford, for the Kesteven County Council. The invited competitors were originally Sir A. Blomfield & Sons, Messrs. Giles & Gough, Messrs. Crisp & Oatley (Bristol), Mr. Jacobs (Hull), and Mr. G. T. Hine. Sir A. Blomfield & Sons afterwards withdrew from the competition, and Mr. Kirk, of Sleaford (the County Surveyor), took their place. Mr. Howell, the late Consulting Architect to the Lunacy Commissioners, was assessor, and awarded the first premium to Mr. G. T. Hine, the second to Messrs. Giles & Gough, and the third to Messrs. Crisp & Oatley. The Committee have adopted the award. The estimated cost of the building is about 100,000*l.*; the estimated cost of the other designs varying from 85,000*l.* to 115,000*l.* As Mr. G. T. Hine has now succeeded Mr. Howell as Consulting Architect to the Lunacy Commissioners, this will probably be the last of the large competitions for asylums in which he has been the winner.

ARCHITECTURAL SOCIETIES.

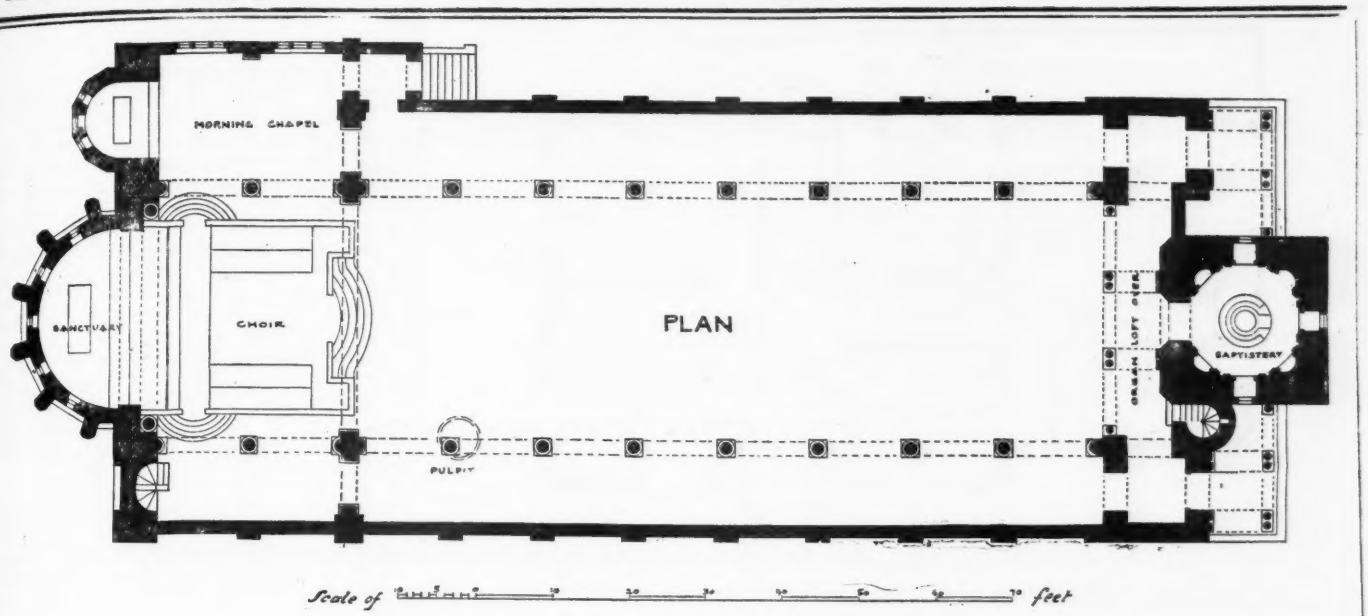
YORK ARCHITECTURAL SOCIETY.—At a meeting of the York Architectural Society, held at the Church Institute on the 24th ult., a lecture was delivered by Mr. Arthur J. Penty on "Haddon Hall." Mr. G. Benson was in the chair. The lecturer spoke of the charm of Haddon, which lay in its purity of style and its simplicity of treatment. Haddon, he said, is a contrast to the everyday ugliness to which we have accustomed our eyes. It is an environment in which the artist loves to work. It uplifts the architect with its thoroughness, making him regret the day when "amateur fancy" was substituted for craftsmanship, which cut us adrift from the true soul of art, and eventually extinguished tradition. We realise to-day how much we have lost when we compare the craftsman of that date with the modern builder. Formerly the master builder was capable of working in a style—a part of himself—the style of his tradition. To-day the builder has nothing in common with himself, which means he has ceased to work in a tradition. He works and lives for utilitarianism alone, excelling only in the technique, often at the expense of the artistic, which latter quality he does not profess to understand. This, together with a desire on the part of the public for novelty in preference to worth, accounts for the prevailing general low standard of the craftsman's art. The lecture was illustrated by sketches and measured drawings made by Mr. Penty from the place, and by lantern views. Votes of thanks were passed to Mr. Penty, Mr. Burleigh, and to Mr. Godfrey Bingley, of Leeds, who lent the greater portion of the slides.—*Yorkshire Herald.*

LEICESTER SOCIETY OF ARCHITECTS.—The annual exhibition of students' work and the distribution of prizes in connexion with the Leicester and Leicestershire Society of Architects was held at the Museum Buildings, Leicester, on the 23rd ult. The prize drawings of the local students, together with a number sent down from the Royal Institute of British Architects, were exhibited in one of the Art Gallery rooms. Mr. Chas. Baker (President) occupied the chair, and, after opening the proceedings, he called upon Mr. Paget, who gave a review of the students' works. The prizes were then distributed by Mr. Clephan as follows:—For a design for entrance-lodge and gates, the first and second divided equally between Mr. Shirley Harrison and Mr. A. Herbert; for measured drawings of old work, first Mr. A. Herbert; second, Messrs. A. B. Widdowson and Traylen (bracketed together); for architectural sketches, first, Mr. A. Herbert; second, not awarded. A vote of thanks was passed to Mr. Paget for his review of the students' works, to which Mr. Paget replied. A similar vote was also passed to Mr. Catlow for his duties as secretary of the Prize Committee, and to Mr. Baker, the President, and the proceedings terminated.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The Edinburgh Architectural Association, by permission of the directors, visited the North British Distillery on the 27th ult. The head brewer, Mr. S. Stevenson, conducted the party over the buildings, which occupy about eleven acres of ground, and have about sixteen acres of floor space. Henning's pneumatic drums were shown at work, and the various processes to which the grain is subjected were followed from the grain stores to the still-house. On the motion of Mr. G. Wardlaw Burnet, advocate, a vote of thanks was passed to the directors and to Mr. Stevenson.

GLASGOW ARCHITECTURAL ASSOCIATION.—On the 22nd ult., Mr. A. N. Paterson, M.A., in the chair, Professor F. M. Simpson, of Liverpool, delivered a lecture on "Reticence in Art." All art, the Professor said, had its limitations, but no hard and-fast rules could be laid down. The quality of restraint was the best quality an artist could possess, and the power of selection the best proof of a man's strength. No compositions of art, said the lecturer, were more original, and displayed more reticence, than were to be seen in the paintings and writings of Mr. Whistler. The limitations of architecture were more strict, as the possibilities were greater, than the sister arts. A building should harmonise with its surroundings, and form a part of the landscape. Old buildings always harmonise with each other, the principal reason being that reticence was given full place to in their design. Over-elaboration, said the Professor, was one of the greatest evils of our modern buildings. A building may be a noble monument of architecture with practically no ornamentation at all. Referring to decoration, the Professor stated that the fewer colours used the more satisfactory would be the result. In wall decoration no more than two main colours should be used. In a living-room, the Professor opined, the two colours should cover the chairs, hangings, and other furnishings. Other colours should be used sparingly. The lecturer then treated on the subject of mural decoration. This, he said, was the noblest branch of the painter's art. In England it was much neglected in the past, and was not yet properly encouraged. In Italy mural decoration was to be seen at its best, and the lecturer enumerated a number of the best well-known examples. The worst art in the whole world, said the Professor, was embodied in the modern school of Italian sculpture—reticence they did not understand. In sculpture a greater amount of reticence had to be observed when it was related to architecture than when it stood alone. Concluding, the Professor said that if the work we do be done honestly, it will be good, no matter whether it be rich or whether it be simple.

THE ARCHITECTURAL ASSOCIATION OF IRELAND.—A meeting of this Association was held on Tuesday evening in the Grosvenor Hotel, Westland-row, the President, Mr. R. Caulfield Orpen, in the chair. Amongst those present were: Messrs. Albert E. Murray, R.H.A.; Geo. M. Ross'; Joseph Holloway, Vice-President; T. Slevin, C.E.; M. J. Tighe, C.E., and R. Butler, Secretary. Mr. W. Kaye Parry delivered a lecture on Drainage and Sanitary Construction, in the course of which he gave a



Proposed Church of St. James the Greater, Leicester. Plan.

most interesting account of the progress of sanitary engineering in recent years. He illustrated his remarks with a large number of diagrams. The lecture was followed with interest by a large and appreciative audience.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—At the meeting of this Society, on the 25th ult., Mr. George Haité read a paper upon "Design and Designers during her Majesty's Reign." Mr. Haité pointed out that of all the movements of this remarkable reign the development of design as an art was not the least important. He protested against the fallacy that art knows no nationality. The study of Albrecht Durer's work awakened a desire to know more of the political and social life of his country during that artist's life time. Watteau depicted life at the French Court, Hogarth the follies of his own time. In the main art was an expression of national sentiment, and we could claim, and be proud of, a national style in the decorative arts; in no other country had the decorative arts so great a claim upon the public as in our own. Sixty years ago design was in a bad way; since then Randolph Caldecott, William Morris, and Walter Crane had given English decorative art an impetus which would long be felt. If the public did not get good designs for the useful and necessary things of life in England, they would get them from abroad. Our industries were of national importance. In France they did not know the value of decorative design in domestic life; the consequence was their industries were vastly inferior to our own. Mr. Haité drew attention to the fact that, of all the arts, none was more useful, none more democratic, and none more neglected than the art of design. The life of a successful designer was not to be compared with that of a painter or sculptor; many great artists had started life as designers, but had forsaken design for painting. Design needed pushing, it needed champions. Architecture, painting, and sculpture had each their recognised institutions; why had not design? No body of workers could suffer more than they did from isolation. He referred to an attempt made to organise a society in 1871, and, though that had proved unsuccessful, he still hoped to see a thriving institution that would bring the designers and their work more before the notice of the public.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of this Institution on the 2nd inst. Mr. J. Wolfe Barry, C.B., F.R.S. (President), in the chair, it was announced that ten Associate Members had been transferred to the class of Members, and that twenty-one candidates had been admitted as students. The monthly ballot resulted in the election of one Member, of fourty-four Associate Members, and of three Associates.

PROPOSED ENLARGEMENT OF MATLOCK PARISH CHURCH.—It is proposed to enlarge this church at a cost of 1,000*l*. The enlargement is to comprise the extension of the south side to correspond with the north side, and alterations to the organ, &c. Mr. P. Currey, of Derby, the architect, has prepared plans.

Illustrations.

ILLUSTRATIONS OF FRENCH CATHEDRALS.

THE illustrations of three French cathedrals are given in this number in connexion with Professor Aitchison's Royal Academy lectures, in the course of which much reference has been made to various leading examples of French Gothic architecture, and more especially to the front of Notre Dame, Paris. Well known as this front is, it is long since any illustration of it appeared in our pages, and one which gives it on a pretty large scale and almost in elevation may therefore be acceptable to our readers.

The west front of Nôtre Dame was commenced in 1215 and completed about twenty years later, so that it has the advantage of an almost homogeneous style. Though with less of charm and richness of fancy than some other west fronts, it has what may be called a peculiarly monumental effect, from the breadth and simplicity of the design, the unusual amount of plain wall surface, and the predominance of the two strongly marked horizontal lines formed by the series of niches and statues in the lower portion, and the arcading above.

Professor Aitchison's special comments upon the design of this front will be found in his third Royal Academy lecture, on page 165 of our issue for February 20.

Beauvais may be regarded as an attempt to rival or surpass Amiens. The latter was commenced in 1220, Beauvais in 1247. Amiens is as admirable in construction as in plan and design; no weakness shows anywhere; it is as stable as when first built. The buttresses of Beauvais were less massive, the piers more slender, the arches wider than those of Amiens; yet Beauvais was designed for a vault of 47 mètres high, as against the 45 mètres of Amiens. One wonders how the faithful could venture into a building so vast, and, to the eye, so deficient in stability. The design outstripped the resources of the diocese. Here, as in other of the thirteenth century cathedrals, insufficient funds entailed poor materials and bad building. It is to this, and not to inherent faults of design, as is generally asserted, that the misfortunes of Beauvais were due. The vault of the choir endured but fifteen years; it fell in 1284. Then intermediate piers and buttresses had to be built, the arches contracted in span, and the whole system of flying-buttresses, pinnacles, parapets, and windows remodelled. Later on, in the days of Louis XII. and Francis I., the transept was built, 1500—1537; and the south doorway in 1548. Then, instead of finishing the nave, to give abutment to the west, Jean Vast set to work to erect a central steeple which should soar above the dome of St. Peter's and the spires of Chartres, Strasburg, Vienna, and Antwerp. His spire was 153 mètres high. But it fell, with its four supporting piers, on Ascension Day, 1573, and Amiens remained the *chef d'œuvre* of Gothic architecture.

Notre Dame de l'Epine is of exceptional interest as a building, constructed in the second half of the fifteenth century. The church, which almost rises out of the fields of a petty hamlet near Chalons-sur-Marne, has two towers, one of them 46 mètres high. The northern spire was taken down when the tower was used as a telegraph station, as shown in Ferguson's engraving, but was rebuilt when the church became a "monument historique." There is an English feeling in the curvilinear tracery of the window, and in the unusual projection of the transept, but hardly sufficient to justify the assertion of Mr. Beresford Hope that it was designed by an Englishman (Patrick). It is, like St. Mary Redcliffe, a kind of a miniature cathedral, and a perfect specimen of its class. The great crucifixion, in full relief, on the central portal, is very noteworthy. A pencil drawing, by Mr. Arnold Mitchell, of the towers and nave from the south-east was reproduced in the *Builder*, February 19, 1887.

PROPOSED CHURCH OF ST. JAMES THE GREATER, LEICESTER.

THIS church is designed on the basilica type, and will seat 900 persons. There is a campanile at the west end, 160 ft. high, and under it the baptistery, with a vaulted roof. There are three entrances—two at the west end and one at the east. Vestries and parish rooms are provided under the chancel and morning chapel.

There will be a great western organ in the loft over the narthex, and a small organ connected with it in the choir.

The materials for the interior are terra-cotta facing and moulded work, faïence panels to the clearstory, and marble columns. Eventually the apse will be filled with mosaic-work. The stalls and fittings are to be birch, stained green, and French polished, the flooring of nave and aisles wood block, and of the chancel marble squares.

On the exterior the materials are to be local bricks and terra-cotta dressings.

GODDARD, PAGET, & GODDARD.

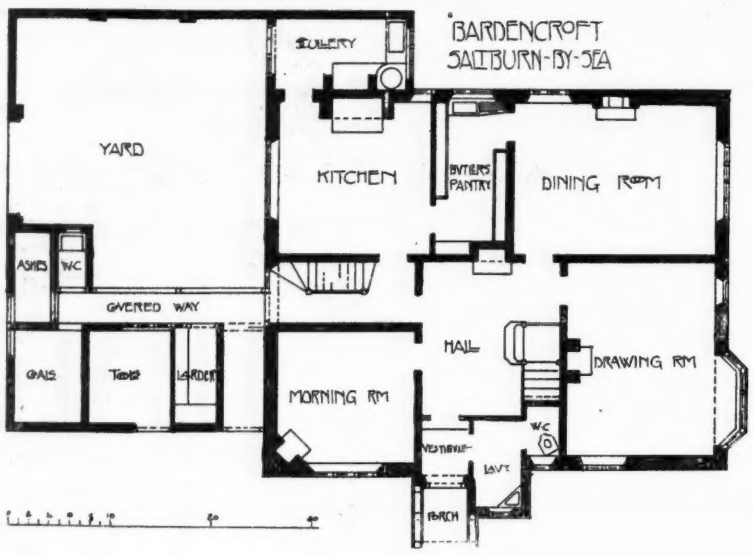
"BARDENCROFT," SALTBURN-BY-THE-SEA.

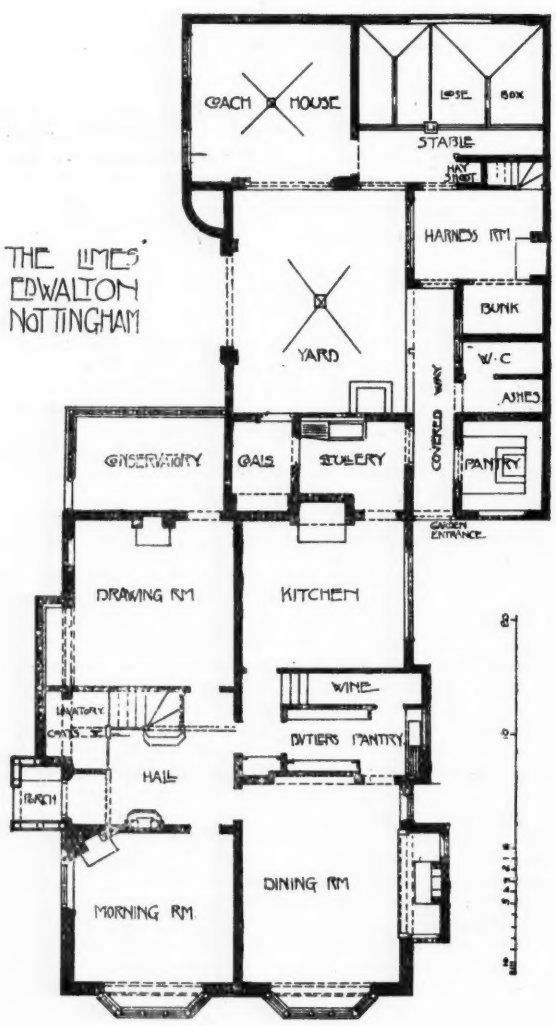
THIS house was erected for Mr. William I'Anson, upon a corner site, the front overlooking the beautiful gardens, also obtaining an extensive sea view beyond. The entrance has a S.W. frontage. The building is of red brick, having a red-tiled roof, with yellow, rough-cast gables. The whole of the woodwork is painted white.

The architects are Messrs. Brewill & Baily, of Nottingham.

"THE LIMES," EDWALTON, NOTTINGHAM.

THIS work comprises a country house, with stabling, &c., at the back, built on a narrow site, with gradual fall from back to front, thus allowing a tennis court to be formed below the terrace wall; also an ornamental garden is formed in front of the drawing-room window. The dining-room has panelled ingle-nook, with beam and shelf over. Messrs. Brewill & Baily are the architects.





DRAWINGS FOR THE ROYAL ACADEMY.

As before, we shall be glad to take charge of and deliver at the Royal Academy any drawings sent to us in time to be photographed before the day of delivery, with a view to subsequent publication in this journal and in the "*Builder* Album of Royal Academy architecture."

We cannot accept any drawings sent to this office later than Saturday morning March 27, before 12 noon.

Architects sending drawings are asked to give special attention to the following requirements of the Royal Academy:—

1. All frames must be gilt.
2. Every drawing must have a label on the back, giving legibly the title and the artist's name and address.
3. Every drawing must have a similar label attached to the frame by a card so as to hang over in front.
4. Every drawing must be accompanied by a letter addressed to the Secretary of the Royal Academy, and signed by the artist, containing the artist's name and address, and the title or titles of the drawings sent. If more than one drawing is sent they must be distinguished by numbers, and the corresponding number must be repeated in the labels fixed to each drawing.

N.B.—We cannot undertake to supply or affix labels when omitted by the oversight of the sender.

ROYAL SOCIETY OF PAINTERS IN WATER-COLOURS.—This Society has received the Royal consent to the President, and all future Presidents of the Society, wearing a collar and badge, when attending her Majesty's levees and on such other occasions as may appear fitting. The badge, which has been designed and executed by Professor Herkomer, is of solid gold oval in shape, and supports a female figure carved in ivory. Above this, and attached to the chain, is a gold wreath encircling the Royal Crown, to which the badge is linked.

Books.

Ironwork. Part II. By J. STARKIE GARDNER. London: Chapman & Hall. 1896.

THIS small work, published for the Committee of Council on Education, is a continuation of Mr. Gardner's first handbook, and comprises the time from the close of the Mediæval period to the end of the eighteenth century, excluding English work. The book is divided into chapters treating each country separately, which is the best arrangement, as the ironwork of each country has a separate character.

Mr. Gardner has the advantage of being fully acquainted with his subject practically as well as historically, and the number of illustrations given render the book an exceedingly intelligible and useful outline of the subject in a small compass.

It is curious to notice how restricted a part Italian Renaissance art plays in ironwork, except in a few special localities such as Siena; iron having been regarded apparently as a material more fitted for practical than for decorative work. A fine specimen of a torch-holder, worked with exceedingly free though simple foliage, is given; one of four examples in the South Kensington Museum. Mr. Gardner says—"As these, and the banner-holders, were only allowed as a mark of great distinction to the few, they are generally richly worked." A candlestick from Pistoja, now in the South Kensington Museum, also illustrated, is remarkable both for its grace of line and also because it presents a kind of union of Renaissance gracefulness and refinement with Mediæval freedom in detail, the form of leafage being a suggestion from nature treated in a form suitable to ironwork.

The finest achievements of Renaissance Italy in metal work were in chased and Damascened suits of armour; but we presume it is considered that Damascening, being the introduction of other metals upon iron, hardly comes into the subject of pure ironwork; at all events no illustrations of it are given.

The object of the book is obviously historical and illustrative rather than didactic; but some brief guiding criticism as to what is really good or bad in the examples given might well have been added; there is occasionally a remark of the kind, but not often. For instance, the seventeenth century screen, fig. 22, with the vase and naturalistic foliage in the centre of it, is given apparently as an example of a fine piece of work, and without further comment; but it surely should have been pointed out that while the border is good design the central panel is bad in design, and moreover is entirely out of character with the border. This is the more important as one of the frequent mistakes in wrought iron design of to-day is the mingling, in one piece of work, of conventional and realistic foliage. This is even worse, perhaps, than entirely realistic foliage, as the two elements will not blend. Again, the German example, fig. 34 in the book, called "a magnificent window grating," is no doubt splendid workmanship, but it is exceedingly bad design, and though it was right to give it as an example of a type of work, the student should certainly have been warned against it as an artistic model. The answer may be, of course, that there was not space to go into the question of design, and that the book was not intended to teach design; but in that case it would have been well to insert a prefatory note to that effect, and that the reader must not necessarily regard the examples illustrated as models of art, but only as historic illustrations of different types of work. This point is really of importance, for while there is a great deal of revived interest in ironwork, it seems to be exceedingly difficult to get some of our clever ironworkers to appreciate the necessity of unity of style in such work, and especially of avoiding realism in metal foliage.

Little of the German Renaissance ironwork illustrated in the book is good; the best examples are the stirrup and horse-muzzle. A seventeenth century door-knocker (fig. 3) a good piece of free design, is (like so many other designs for this purpose, old and new) bad as a door-knocker, because there is no suggestion of hammer-like power in the knocking portion. The knocker from Jacques Cœur's house (fig. 4) is instructive in comparison, as it really looks like a thing designed to knock with, though it would have been still better if the lower knob, which does the knocking, had been larger and heavier than the upper one, which is only the hinge.

The chapters and illustrations on Spanish and

Fig. 1.—Bad Wrought-Iron Design.

Fig. 2.—Good Wrought-Iron Design.

Fig. 3.—A Bad Knocker.

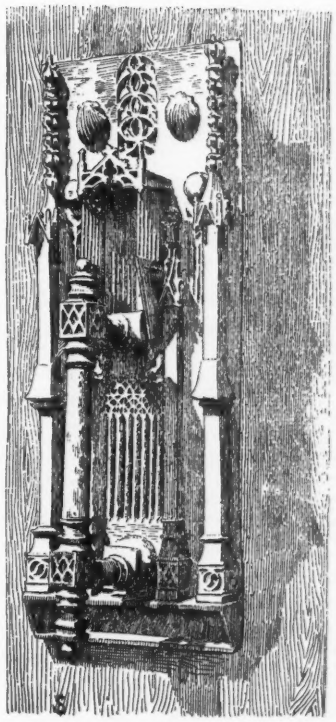


Fig. 4.—A Good Knocker.

French ironwork are far more attractive, and Mr. Gardner points out how much there is yet unknown in this country in regard to the glories of Spanish ironwork. Speaking of some of the great balustered screens (*rejas*) round the choirs of the Spanish cathedrals, he observes that, as in an example from Avila Cathedral, only the spindle-shaped balusters are forged in solid metal, the pilasters and some of the cornice work being merely of wood cased with thin *repoussé* iron. Many of the objects illustrated in the chapter on France are in every way admirable, until we come to the late Renaissance period, when taste and style became far more questionable. One of these (fig. 1) may serve as a typical example of bad ironwork design, in contrast with the fender and light-holders shown in fig. 2. The examples are all from blocks lent us by the publishers.

The book is generally very well written as well as full of information, but the author has made an absurd mistake in his idea that Othello's sword of "the ice-brook's temper" was a reference by Shakespeare to the celebrity of the "Innsbruck" weapons. It has nothing to do with Innsbruck; Othello specially says it was "a sword of Spain," and the expression "the ice-brook's temper" refers to the practice of plunging the best sword-blades, red-hot, into ice-cold water, to temper them.

The Illustration of Books: a Manual for the Use of Students. By JOSEPH PENNELL. London: T. Fisher Unwin; 1896.

MR. PENNELL has done such a great amount of book illustration that it may naturally be supposed that he has had experience of most ways of reproducing work, and of making drawings for reproduction; and his book, which deals with line drawing and washed drawings for mechanical reproduction, wood engraving, lithography, etching, and photogravure, contains a great deal of information as to the best materials, the best way of drawing for various methods of reproduction &c., which may be taken to be the result of experience, and which is for the most part entirely in accordance with our own experience as to method and material. We do not quite understand why the author, in the chapter on etching, should give the first place to the method of drawing the whole subject, partly biting it, and then stopping out the portions which are not to be bitten any more, and only describe as an alternative the method of beginning on the darker portions, and drawing the lighter ones only for the final biting. The latter system saves the trouble of stopping out, and certainly seems the most direct and logical one in a general way. In referring to the difficulty of getting used to see your drawing in light lines on a dark ground (the exposed copper being lighter than the smoked varnish), and to estimate its ultimate effect, which is always a stumbling-block to beginners in etching (and sometimes to those who are not beginners), Mr. Pennell seems to have overlooked the fact that Hamerton concocted an etching varnish which leaves a white surface and against which the copper shows dark, enabling the artist to see approximately the balance of his darks and lights before biting; it is described, and the method of making it given, in "Etchers and Etching."

We entirely agree with Mr. Pennell in his remark, in the chapter on "Wood-engraving," that the art of engraving round lines made with pen, brush, or pencil, is an easy one compared with that of inventing touch and texture in translating a work in colour into black and white; but while on the subject we should like to have seen a word said in favour of the old system, now nearly superseded from considerations of time and economy, in which the original artist drew the actual lines on the block and the engraver merely cut away between them, a process which, as the author says, "only requires much training and a steady hand," but which makes the engraving the real expression of the artist's line. Now there is little more real "drawing on wood;" the subject is photographed on to the wood and the engraver proceeds practically to draw it, or cut it out; he may be an accomplished artist, but he has not the freedom of line which a man really drawing on wood can have, where the original line can really be as free as in etching. Commercial conditions have altered all this.

Seeing that Mr. Pennell has really a great deal of information and advice to give which is exceedingly useful to beginners in any of the illustrative methods described, it is a pity that he could not be content to convey it in simple and unaffected English, instead of in the kind of off-hand "slap-dash" style, freely sprinkled with colloquialisms, which among a certain class of artists seems to be

thought a fine way of writing, but which in fact is only a form of literary vulgarity.

Metallic Structures. By JOHN NEWMAN, A.M.Inst.C.E. London: E. & F. N. Spon. 1896.

AT the present time there should be few more important subjects for the consideration of the designer of almost every class of structure than the action which the surrounding atmosphere will ultimately have upon it.

We fear it is too often the case, not only with architects, but also with engineers, that the question of the protective coating, on hidden metal work especially, is either left to chance or to the supplier of the material, who, having probably taken his contract at a cutting price, does not spend more than he can help, either on the paint used or its application. If the work is of such an important nature as to require inspection at the maker's works, the inspector generally requires to see it *before* it is painted, and after inspection it is, more often than not, hurriedly painted in the open, "rain or shine," by the cheapest of unskilled piece-work labour.

So little is known by the average engineer and architect about paint and other protective coatings that, beyond specifying that the work is to receive a certain number of coats of "best approved oil paints," very little further notice is taken of what is actually done in what, after all, is of the greatest importance in securing the extended life of the work. A considerable amount of ignorance still unhappily exists as to the galvanic action which certain metals exert upon each other. Not long ago a case came under our notice in which a copper gutter of considerable importance was specified to be put together with *galvanised iron* bolts, and certain fittings were similarly to be galvanised! It is, therefore, an excellent thing when authors conversant with those subjects direct their energies to works on corrosion and its prevention, which has not as yet, we fear, received that consideration which it deserves.

Mr. Newman's book is intended to be "a practical aid book to the safety of works in iron and steel," and contains much useful information. It is, however, somewhat heavy reading, being a volume of 368 pages, closely written, and containing paragraphs extending in some instances over three pages. It seems a pity that authors fail to realise that, although there may be some who can spare the time to read their books from cover to cover, yet, in the majority of cases, the principal use of such works, as we have at present under consideration, is that of reference in particular cases which come under the consideration of the individual reader. It is thus of the greatest importance that the matter dealt with should be classified under head-lines easily recognisable and quickly found. We regret to say that in this respect Mr. Newman fails signally, and as he is somewhat verbose, this fault is accentuated. His somewhat frequent lapses into poetry are also a little irritating, and at first sight it is difficult to see the connexion between Milton's "Paradise Lost" and the prevention of fouling and corrosion in submerged structures.

There is, however, a great deal of very useful matter in the book, which is compiled from many reliable sources of information, as well as from evident personal knowledge, and we therefore recommend it to the notice of those of our readers who wish to be informed on matters in connexion with protective coatings for metal structures, as well as on the important point of knowing good paint from bad.

Practical Tunnelling. By the late D. KINNEAR CLARK. Fourth Edition. London: Crosby Lockwood & Son. 1896.

IN the broad sense of the word there is very little new matter that can be written about the making of tunnels, and yet, in detail, the advancement in modern high explosives, in drilling and excavating plant, and in compressed air machinery, has made practically possible works in tunnelling hitherto almost unattainable. At the same time the ever-growing demands for cheap transport for man and his handiworks have created fresh fields for the art of tunnel making.

Tunnelling is not by any means as simple as it may at first sight appear from an inspection of the finished work; nor is it reducible to a hard and fast science to anything like the same extent as are most other engineering feats. And thus it is that the records of what has already been found feasible and satisfactory are of the greatest service to those embarking on fresh enterprises. The number of engineers in this country is not great who have a practical knowledge of the ins and outs of tunnelling through difficult ground, and the expedients which must be resorted to in order to meet difficulties likely to arise; difficulties which in many cases have to be combatted by the contractors' agents or foremen whose efforts are seldom if ever recognised by the public.

A most useful record of the greatest works in tunnelling may be found in the late Mr. D. Kinnear Clark's book, which, in its fourth edition, was greatly extended and nearly brought up to date, by its gifted author, just before his death. The difficulties incidental to tunnelling are not familiar. Technical journals from time to time instance some new success, some fresh achievements of the engineers' skill in tunnel-making, but notwithstanding this, the number of people is small who have a clear grasp of the actual methods employed in overcoming the many difficulties which present themselves from the very outset of such works; and it is thus with the greater regret that we note in passing the recent death of Mr. Greathead, who has done so much in connection with cast-iron tube tunnels. To those resident in London, the works now in progress in connection with the Blackwall Tunnel, the Waterloo and City Railway, and the Central London Railway, are perhaps of greatest interest; the first-mentioned work being, of course, the most difficult to carry out, owing to its great size, and the nearness of the crown of the tunnel to the river bed, which in places threatened to be an almost unsurmountable difficulty. Had it not been for the form of shield used in driving this tunnel, no doubt the work could never have been carried out.

In Mr. Clark's book we find records of all the important tunnels of recent years, both in England and on the Continent, whether for railway, water supply, or subway purposes. The description of the fourth piercing of the Alps by means of the Simplon Tunnel, now in course of construction, which is of more than usual length (twelve and a quarter miles), and the consequent difficulty of ventilation, the possibility of working only from two faces, and the end sections being curved, render it a more than usually interesting case. Reference is also made to the successful invention of Messrs. Fennings & Stannard, which was employed in the construction of the new King's Cross tunnel, resulting in much saving in labour and material. Under this system a short metal lining is formed of needles about 2 in. thick, which, after the work is started, rest upon the outside of the brick lining, provision being made for pushing the needles forward as the excavation proceeds and the lining is inserted. Their front ends are supported on timbering, and the space round the brick lining left by the progressive movement of the needles is filled up by cement grout, introduced through holes in them.

Many other interesting descriptions are also given of tunnelling under various conditions, as well as the methods employing in setting out and levelling, and general rules for construction.

Laxton's Builders' Price Book for 1897. Containing above 72,000 prices. Eightieth edition. London: Kelly & Co., Limited. Pp. cvii., 750 and 111.

BOOKS, like men, grow old, and while, undoubtedly, "Laxton's" is still wonderfully young in many respects, traces of hoary age do as undoubtedly grow manifest to the close observer. Perhaps this is especially the case in the section entitled "Smith and Founder," where a description of cast-iron girders appears, and a quite unintelligible table of the loads which cast-iron girders of unknown size and weight will safely bear. Steel riveted girders and stancheons, and steel angles and tees, are conspicuous by their absence. The first three paragraphs of the chapter on "Fireproof Construction" also bear traces of age, and a sentence on page 314 respecting the services to water-closets appears to have been written before the days of separate closet-cisterns. Indeed, to several of the "memoranda" introducing the different branches of builders' work exception might be taken; *e.g.*, under "Ventilation" we read that "the admission of fresh air should undoubtedly be through an external wall, as near the floor and as far from the fireplace as possible. For this purpose air-bricks should be placed in the wall behind the skirting, with a hit-and-miss ventilator let into the skirting to regulate the inlet." Most of these "memoranda" might be omitted with advantage, and with them would vanish nearly all the marks of age to which we have alluded. We notice that the prices for Welsh slating have been largely increased since the last issue. In the alphabetical list of Yorkshire stone quarries, Ringby has been for the first time included, but, unfortunately, it is printed "Kingby," and is, therefore, not in its proper place in the list.

The book is undoubtedly most useful, but in everything human there is room for improvement, even in "Laxton's." Let us hope that the eighty-first edition will bear fewer marks of antiquity than the eightieth, and will be brought more up to date by the inclusion of a section on Constructional Steel-work. Additional information on terra cotta would also be useful, and on p. 151 the different qualities of oak might be specified and priced.

Kirkpatrick's New System of Carpentry: being an absolutely new departure in this important branch of the mechanic arts. By C. A. KIRKPATRICK, Practical Mechanic. Boston. 1896. London: Sampson Low & Co. 1896.

SUCH is the somewhat startling heading of the title-page, which is further graced by assertions of a similar character, printed in every conceivable variety of type. The introductory chapter deals with this "new system of carpentry," in which the author seems to think highly of being able to obtain the lengths of roof timbers, including valley and hip rafters, from one and the same line. The line mentioned is the level distance from the outer face of the plate to a point plumb beneath the nearest side of the ridge. Our author then goes on to explain this new system, which he seems to imagine a great advantage; but we do not see the improvement on the systems ordinarily in vogue among carpenters.

Yet the author says that he approached them in the "utter dark;" that "the obtaining of many of them was a matter of no small mental strain;" and "in truth, simple as they appear now they are got, the finding of some of them consumed two full days." Little regard to the strict requirements of etymology has been paid in the new names that appear in this "new system." We are afraid that these alone would baffle the comprehension of the intelligent British carpenter.

Architects' Joinery and its Ornamentation. By F. A. FAWKES. Revised edition. London: B. T. Batsford. 1896.

THIS is a revised edition of what may be described as a very superior trade catalogue. It consists of sections of mouldings to door panels, architrave mouldings, dado and picture rails, cornices and ceiling mouldings, skirtings, and the like. These are shown in full size, and also in photographs from the finished work, so that one can see the effect of sectional forms when in position, which is just what is wanted.

Various types of doors are shown, and friezes and pediments, the design of some of which might be improved. Dado panelling is not forgotten, and there are some really very satisfactory designs for wooden chimneypieces of a small and unpretending type.

There is one thing in the preface to which we could take exception. It is stated that "the enrichments, which are securely fixed to the wood mouldings, are made of a specially tough composition, which is not liable to crumble, chip, or crack." Is it desirable or necessary, except on the ground of expense, to stick "enrichments" on to wood mouldings made of "composition," whether "specially tough" or not?

Familiar Wild Flowers. By F. E. HULME. Cassell & Company, London, Paris, and Melbourne. 1897.

THIS is a re-issue, as a popular edition, of Mr. Hulme's well-known work, to be complete in twenty-one monthly parts, at 6d. each. The carefully executed coloured illustrations of flowers are thus brought within the means of a very large circle of purchasers.

TRADE CATALOGUES.

WE have received the new catalogue of Messrs. Easton, Anderson, & Goolden, London and Erith. The work executed by this Company is most comprehensive, including as it does "every class of machinery—steam, hydraulic, and electric," many examples of which are set forth in their catalogue. The Company is an amalgamation of Messrs. Easton & Anderson and Messrs. W. T. Goolden & Co., the former having an experience of over seventy years in the manufacture of hydraulic and general machinery, and the latter having devoted their attention to electric

plant. The combination of these two firms should therefore be a strong one, notwithstanding the withdrawal from the business of Dr. William Anderson, C.B., F.R.S., who, in 1864, laid out the Erith works, and who is now Director-General of Ordnance Factories. The Company's works cover an area of some seventeen acres, having both railway connexion and a considerable water frontage on the Thames, and they carry on a considerable home trade in all kinds of hydraulic and waterworks plant, engines, lifts, cordite machinery, electric mining machinery, electric lighting and haulage, cranes, crushing mills, &c. The catalogue comprises some 116 pages, with a large number of illustrations of work actually carried out. Only the smaller class of manufactures are priced, which we consider a wise course, as those given for large machines in a general business catalogue, must as a rule be very misleading. In the matter of lifts, both the hydraulic direct-acting and the hydraulic suspended systems are described and illustrated. A very simple and compact design of electric lift motor and gear is also shown, the advantages of this system of working being pointed out, where the current from an Electric Supply Company is available. The Company also make a good type of hydraulic ram suitable for domestic purposes in several sizes. The catalogue is neatly got up, the various machines being grouped into sections for easy reference. —— The new catalogue of the Edison and Swan Electric Light Company is a very carefully compiled production and contains many novelties. It shows clearly that the higher voltages adopted by so many supply stations have brought a demand for high insulation fittings. The great improvement shown in the electrical design of these fittings will go far to remove one of the greatest objections to a 200-volt supply from the consumer's point of view. The high insulation lampholders and cut-outs are excellently designed and are a great advance on the older types. The interior of the lampholder consists of one piece of porcelain, into which two metal blocks, fitted with contact plungers, are sunk, thus completely separating the poles and at the same time making contact with the outer metal case impossible. The "anti-shock tumbler switch" is also well adapted for high voltage supply, and as its price is very little over that of the ordinary switch it ought to be widely used. The section on ship fittings shows the high standard attained by this Company in the manufacture of substantial accessories. On the other hand, the "Ediswan" watch lighting set containing battery, lamp, flexible cord, &c., is cheap and ought to become popular.—— We have received from "The Lighting Corporation," which is now the holder of the Wenham patents for gas lamps, their illustrated catalogue, in which special attention is given to methods of combining efficient gas-lighting with ventilation. The merits of the Wenham system of gaslight we testified to when the patent was first started; and amid the artificial lights which are endeavouring to contest the palm with electricity it seems likely to keep a prominent place. The catalogue includes also a section illustration of the Company's automatic gas governor, the object of which is to regulate to a uniform volume the consumption of gas in a burner under any variations of pressure. The "Lucal" lamp for contractors appears to be a powerful and economical one for its purpose. The ornamental designs for ventilating globe and half-globe lights are not better than usual, but in every other respect we recommend this catalogue to the attention of those concerned in lighting either public or domestic buildings.——Messrs. Z. D. Berry & Sons send us the illustrated catalogue of their improved radiator for hot water or steam, by which they claim to give greater heating surface per space occupied than is given by any other radiator. The amount of superficial feet of heating surface for each size of radiator is included in the price list.—— Messrs. Line & Son, of London and Reading, send us a pamphlet on the advantages of their washable distemper, called "Duresco," which is described as "a full-bodied zinc white, which is ground in a liquid silicate and special varnish of great crust-forming properties." If Messrs. Line & Son will send us a small sample we shall be better able to form an opinion on its value than from a description. If it does all they claim for it it is no doubt well worth attention. We receive also from Messrs. Line & Son their catalogue of wall-papers and decorations in relief. Some of the wall-papers founded on foliage are very good in general design and style, though the firm do not seem to employ any artist of known standing to design them; at all events they give no designer's name. The catalogue also gives specimens of relief designs in Lincrusta-Walton and "Lignomur," of which a large number of patterns are kept in stock; also of their asbestos "Salamander" decorations for ceilings in relief, and which are recommended as forming a ceiling decoration which is absolutely fireproof.——Messrs. Hamilton & Co. send us their illustrated catalogue of painting brushes, graining tools, and painters' and plumbers' sundries, including paper-hanging tools, brazing and soldering lamps, &c.——Messrs. G. B. Kent & Sons send us their catalogue of painting brushes, both for house-painters' and artists' work.—— Mr. Robert D. Stewart (London) sends us his catalogue and price list of paints, colours, oils, varnishes, also of various special implements for builders, painters, &c.——Messrs. Pierson & Co. (London) send us their catalogue of cast and wrought steel and ironwork, chiefly of constructional character—rolled steel girders, steel plate tanks and doors, fireproof floors, steel columns, iron and steel roofs, &c. They offer also a novelty in the shape of rolled iron mouldings.—— Messrs. D. & J. Tullis (Kilbowie, Glasgow), send us a catalogue of laundry machinery manufactured by them, including various types of rotary washing machines. Among the objects described and illustrated is the new patent brass inside shell for rotary washers, which can be fitted to any of their machines. The object is to lessen wear, the rivetting being done from outside only, and all sharp edges are removed from the inside. The catalogue includes also roller ironers, boilers and engines, everything required to complete laundry plant.——Messrs. John Dickinson & Co. (London) send us a set of specimens of papers for wrapping purposes, from thick browns to light papers; a class of article which is of importance to many of our readers in regard to the putting up of drawings, &c.

Correspondence.

To the Editor of THE BUILDER.

THE ARCHITECT'S MODEL.

SIR,—Mr. Edwin Seward's suggestions, that the art of architecture is placed before the general public under somewhat unsatisfactory conditions, is one that will evoke a sympathetic chord in most architect's souls. His practical suggestion for the remedy is one that does not go far enough perhaps. The people who visit building trades' exhibitions are not altogether those whom we would wish to influence.

It seems to me that to fellow-architects, builders, and workmen, we rightly convey our artistic (if any) meaning by means of drawings to scale or perspectives on the flat. We can all imagine the rest for ourselves. The general public, however, do require some further translation: and it does seem probable that a sufficiently adequate translation might be furnished by means of models, certainly made to scale, but not necessarily very elaborate, now constructed at great expense. It is quite true that the criterion of an architect's work must be centred in the buildings he erects, and that there must necessarily be some deception about a mere model. It is, moreover, impossible to give the texture of each material imitated without a large expenditure of both time and money. I believe that the public would forego these disadvantages while thanking us for other advantages furnished them over and above those which are now provided solely by drawings on the flat.

I have lately taken some pains to make for my clients simple models of proposed work, and have found from actual experience that greater interest is aroused and their sympathy augmented thereby. I am confident that both young and old prefer to look at an architectural model in place of a drawing wherever practicable.

Architects labour under great disadvantages; their finished works are not transferable by train, neither can they inscribe their names legibly or illegibly in the corner of their works. Art, as understood by the general public, must come forth from a studio, and be contained within the limits of a gilt frame.

If, therefore, architects do nothing to assert themselves or their art in the same practical manner as do the painter-artists, they have only themselves to blame for the natural consequences.

I would therefore suggest that discussions on this matter of models be raised in all architectural societies, but on the idea that any exhibition should stand entirely on its own basis, and not form a mere side-show in an exhibition of a sister art. Heaven helps those who help themselves. I am willing to assist any "trial trip" in the direction of an exhibition, purely architectural, of models (or combination of models and drawings) to the extent of fifty pounds. I cannot say more or do more to any purpose, not being a member of any learned Architectural Institute or Society, and only personally known to a few fellow architects by the abbreviated name of

"PILK."

THE DRAWING OF "A THIRTEENTH CENTURY ARCHITECT."

SIR,—A very good reproduction of the drawing will be found on p. 50 of the *Masonic Magazine*, November, 1881. D. M.

"SKETCHES OF LONDON STREET ARCHITECTURE."

SIR,—In your notice of No. 63, Sloane-street (of which a sketch appears in your last issue) the architect's name is given as Mr. Fairfax B. Wade. This is not correct, as I was the architect.

T. LEONARD WILLIAMS.

*** We do not understand the meaning of the above letter, as we received the description of the house from Mr. Wade, in what we believe was his own writing.—ED.

The Student's Column.

SPECIFICATIONS.—X.

IOINER—(*continued.*)

WE have in the two previous chapters given examples of the mode of specifying the most general items of joiner's work, but there are others less general, but occasionally required, of which it may be useful to the student to have instances, and some of these we now give.

Window Shutters.—The windows numbered on plans to have 1¼ in. boxing shutters in leaves three panels high, moulded both sides; the back flaps to be also 1¼ in. in leaves three panels high, but moulded and square. The shutters to be full height of windows, and hung with a pair of 3½ in. wrought-iron butts or back flaps, as necessary to each leaf, in 1¼ in. cross-tongued and beaded boxings, with architrave moulding out of 3½ in. by 2 in. Each set of shutters to have 1⅜ in. by ¼ in. steel shutter bar, 3 ft. long, with spring catch fastener and 14 ozs. bell, with spring and clip. All stiles to have rebated and beaded joints.

The windows numbered on plans to have 1¼ in. boxing shutters, 5 ft. 6 in. high, in two panels, moulded and square each leaf, the back flaps to be 1 in. thick in two panels, square both sides. The shutters to be hung in 1 in. cross-tongued and beaded splayed boxings, with a pair of 3 in. wrought iron butts or back flaps as necessary to each leaf. Each set of shutters to have 1½ in. by $\frac{3}{16}$ in. steel shutter bar, 18 in. long, with spring catch fastener. All stiles to have rebated joints.

The windows numbered on plans to have 1¼ in. moulded and square shutters in two panels each leaf, double hung with best flax lines, and brass bushed axle pullies in deal-cased frames to match those of sashes. Each pair of shutters to have a 4 in. brass shutter screw and socket, and a pair of brass drop shutter rings, and a pair of 3 in. brass flush shutter lifts to each leaf. The boxing to these shutters to have 1¼ in. moulded and square front in two panels tongued to floor, ⅜ in. ploughed and tongued back, and 1¼ in. hinged cover with rounded nosing, hung with a pair of 2½ in. brass butts.

The windows numbered on plans to have a pair of 1¼-in. framed shutters, with solid panels tongued and V-jointed, hung folding with a pair of 4½-in. wrought-iron parliament hinges to casement frames, and fitted with oak blocks plugged to wall, and strong wrought iron cockspur shutter fastenings, also a pair of 6-in. wrought-iron barrel bolts. Each leaf to have heart-shaped perforation 6 in. by 6 in.

French Casements.—The windows numbered on plans to have 2 in. ovolo moulded French casements, hung folding with hook rebate (or rounded and grooved heels) and moulded weather fillet out of 2½ in. by 1½ in. on meeting stiles, and rounded tongue, 1¼ in. thick, on hanging stiles. The bottom rail and sill to have Elliott's weather-bar, p.c. (or specify any other method preferred for keeping out rain between bottom rail and sill). The casements to be hung with a pair of 4 in. wrought iron butts to each leaf to 4½ in. by 4 in. rebated and beaded frame, with hollow groove as water stop 1⅜ in. wide. Sill to be 6 in. by 4 in. oak, sunk weathered and throated, and fitted with Elliott's weather bar as above mentioned (or otherwise, as the case may be). Put to these casements ⅞ in. brass espagnolette bolts p.c.

Coach-House Doors.—The doors of coach-

house to be 2½ in., framed, ledged, and braced, the ledges and braces 1¼ in. thick, the filling-in of inch matched and V-jointed boarding in half batten widths, stiles, top rail, and braces 5½ in. wide, ledges and bottom rail 9 in. wide. The doors to be hung with a pair of Collinge's gate hinges 3 ft. 6 in. long, to each leaf, to 6 in. by 4½ in. rebated and chamfered frame, and to be fitted with a 12 in. wrought-iron barrel bolt, and 30 in. wrought-iron rod bolt, and 9 in. oakbound stock lock.

Stable Doors.—The doors numbered on plans to be 2¼ in., framed ledged and braced, the ledges and braces 1½ in. thick, the filling-in of ⅞-in. matched and v-jointed boarding in half batten widths, to be hung in two heights with rebated joint to meeting rails, with a pair of 4 in. wrought iron butts to each leaf to 4½ in. by 4 in. rebated and chamfered frame. The doors to be fitted with brass flush-handled stable latch, 6-in. wrought-iron barrel bolt, and 8-in. oak-bound stock-lock.

Cisterns—Construct cistern to be placed in roof over with 1½ in. cross-tongued and dovetailed sides and 1¾ in. cross-tongued and dovetailed bottom. The size of cistern to be 4 ft. by 6 ft. by 3 ft. 6 in. internal dimensions. To each internal angle put splayed angle fillet out of 3 in. by 3 in., and leave all internal surfaces fair and clean for plumber. Around outside of cistern, nail tightly-stretched hoop iron 18 gauge inch wide, best quality, three rows 6 in. from top and three rows around middle of height. The cover to this cistern to be ⅞ in. matched boarding, made in three divisions each with two ledges 1¼ in. by 4½ in. Fix cistern in roof on strong fir bearers, and cut necessary holes and dishings for plumber's work.

Dwarf Cupboards.—The method of specifying these would be similar to that already given for ordinary cupboards, except that the top might be of some hard wood and would be described thus: The top to be of 1¼-in. selected Riga wainscot, cross-tongued, and with 1½-in. by 4½-in. ledges on the underside, secured with slotted cups and screws, and buttoned down to framing. The nosing of top to be rounded.

Sliding Partitions.—The sliding partitions in to be 1½ in. framed partitions in (two?) divisions, each division in six panels square, the middle panels open and prepared for 26 oz. sheet glass, the others ½ in. thick. The partitions to be hung from wrought steel rail on bressummers, with two wheels to each division, and oak threshold 4 in. by 3 in., with small tram rail let in, and steel stubs and plates on lower edge of framing. For the wheels, rails, and stubs provide the p.c. sum of , including carriage and delivery on the works. The contractor is to fix these special items of ironmongery as directed. Each division to have also a pair of brass pull handles, p.c. , and mortice locking-latch, p.c. .

(N.B.—There are various patented forms of sliding and folding partitions now on the market which require, usually, some amount of special preparation. The nature of this should be ascertained from the patentee, and specified, and a lump sum provision included for the patentee's work, making it quite clear whether the provision does or does not include for carriage, delivery, fixing, priming, painting or ironmongery.)

Laundry Fittings (domestic).—Fit up laundry with three washing tubs of 1½ in. clean deal wrought both sides, splayed, and put together with dovetailed angles in white lead. The size of tubs to be 2 ft. 6 in. by 1 ft. 9 in., and 12 in. deep internally, and to have 2 in. brass plug, washer and waste, and 1½ in light lead pipe as waste to empty into channel in floor.

Fit up 1¼ in. clean deal ironing board, where shown on plan, hung with 1½ pair of 4 in. wrought-iron butts and hanging stile out of 4½ in. by 1¼ in., plugged to wall. Put underneath board two folding trussed brackets out of 2½ in. by 1½ in. with heel blocks and pins. Provide two clothes racks, each 5 ft. long by 3 ft. high, with 2 in. by 2½ in. ends, and three rails 1½ in. by 1¼ in. morticed and tenoned, and pinned to ends. These racks to have pulleys, lines, and belaying cleats for hoisting to ceiling.

Ironmongery.—In specifying ironmongery it is unwise to follow the example of a bill of quantities and dissociate the items from the parts of the building to which they refer. There are, however, general clauses relating to ironmongery which may be given under the one collective heading. For example, if in the case of locks it is necessary that a master-key shall command the whole, it should be specified that the whole of the locks are to be under one mastership, with wo (or more, as the case may be) keys to pass. If sub-master-keys are required for various parts, or if there are several masterships, this should be clearly defined.

As regards quality, it is of little use to specify the best quality or to attempt to define the quality, as this varies, by almost imperceptible gradations, from a very high standard to a very low one. The only really satisfactory method for a young architect to adopt is to put himself into the hands of a trustworthy ironmonger, and include in his specification a fixed price for a fixed quality and article which he has already arranged with the ironmonger. There is, of course, a tariff price for ironmongery, and it would be possible to specify the ironmongery by a p.c. price, leaving the ultimate selection till later; but in this case there is the difficulty that different tradesmen treat the tariff differently, and unless the builder knows, before tendering, through whom the ironmongery is to be bought, his estimate must be speculative unless the architect allows the builder to select the ironmonger—a course which is open to some objections.

GENERAL BUILDING NEWS.

ADDITIONS TO S. GABRIEL'S CHURCH, PIMLICO.—The Bishop of London consecrated, on the 1st inst., the additions which have been made to S. Gabriel's Church, Pimlico. The church is a well-proportioned Gothic building with three aisles, chancel and western tower and spire, but the beauty of the building was not a little disfigured by the unsightly side galleries which have just been removed. The additions, which consist of north and south aisles, a new south chapel in memory of the late Rev. Brymer Belcher, the first vicar, a west gallery and a west porch, the gift of Lord Edward Pelham Clinton, have been carried out by Mr. John Thompson, of Peterborough, at a cost of some 6,000*l.*, from the designs of Mr. Arthur Baker, of the firm of Messrs. Baker & Turrill, in harmony with the original design. The extra width given by the additional aisles and the double arcade on each side of the nave have increased the picturesqueness of the interior, which has also been enriched by the groining of the aisle roofs, and by the richly-carved oak front of the west gallery carried on a stone arcade. The chancel has received a new east window, designed by Mr. Kemp.

ENLARGEMENT OF PREMISES, GOLDEN-LANE, LONDON.—Messrs. Suttons, the well-known carriers, are considerably enlarging their premises in Golden-lane, London. The plans have been prepared by Mr. Hamilton, and the contract has been secured by Mr. B. E. Nightingale. The floors of the building are to be fireproof on the Fawcett system, and the constructional iron and steel work is being supplied and erected by Messrs. Mark Fawcett & Co.

CAFE, LIVERPOOL.—A cafe in connexion with the Cotton Exchange has just been erected at the corner of the Exchange at Liverpool. The cafe has three entrances, one in Brown's-buildings, one in Rumford-street, and one in Water-street. All the work has been carried out by Messrs. Warings, Limited. Mr. J. F. Doyle, of Liverpool, was the architect.

RESTORATION OF CHURCH, DUFFIELD, DERBYSHIRE.—The contract for this work has been let to Messrs. Bridgeman. The addition of a South Chapel to the existing edifice will be first commenced. The principal alterations to be undertaken are of an internal nature, and comprise a new floor, new oak pews, remodelled heating apparatus, the addition of a chancel screen and organ screen, and paving the chancel with black and white marble, together with extensive decorations. The work will be carried out under the superintendance of Mr. J. Oldrid Scott, F.S.A.

WORKMEN'S DWELLINGS, HORNSEY.—On the 23rd ult., at the Hornsey Urban District Council Offices, Colonel A. G. Dunford, R.E., held a Local Government Board inquiry into the application for sanction to borrow 27,500 for the erection of workmen's dwellings, 2,790*l.* for purposes of street improvement, 2,779*l.* for works of sewerage and surface water drainage, and 2,184*l.* for other works. Mr. E. J. Lovegrove, Surveyor, was in attendance.

RESTORATION OF LLANBEDR CHURCH, BRECONSHIRE—This church has just been reopened after restoration. The actual work of restoration was commenced in April last, the architect being Mr. J. L. Pearson, R.A. The work has been carried out by Messrs. Luscombe & Son, of Exeter. The whole of the church, with the exception of the tower, has been renovated.

CHURCH, LUNDY ISLAND.—The new church of St. Helena, Lundy Island, is approaching completion. The building is of thirteenth-century style, and it consists of nave, chancel, with north transept, intended as an organ chamber, and vestry. The lower part of the tower (which is 70 ft. high) will serve as an entrance porch, and there is a square turret at the south-east angle of the tower, which gives approach to the belfry, in which is to be a peal of bells. The roofs are of steep pitch, and formed of split stone slabs of Tetbury stone. The building is built of grey granite, with dressings of Doulting stone. In a niche in the tower is a large statue of St. Helena. It is the handiwork of Mr. Harry Hems, of Exeter The interior walls are lined with red brick throughout, relieved by bands and diaper of blue Staffordshire and cream-coloured Marland bricks. There is a chancel arch, carried by polished Purbeck marble columns. Two granite steps bring the worshippers to the floor of the chancel, and two more to the altar rails. A dwarfed screen of carved stone divides nave and chancel. The altar rails are of oak, upon brass standards. The foot pace, upon which the oak altar stands, is of polished Devon marble. There is a sedilia upon the south side of the sanctuary, and opposite thereto a carved piscina. The east window is a three-light one, filled with stained glass by Messrs. Clayton & Bell, of London. Immediately beneath the window is a carved and sculptured reredos. The super-altar is of polished veined alabaster, and the main portion of the reredos proper consists of three distinct divisions, gabled and crocketted, and divided from each other and flanked by clustered columns of polished Purbeck marble. The sculpture is in exceptionably high relief, the central panel representing the Last Supper, whilst that on the dexter side shows the Institution of the Passover, and on the sinister of the Scape Goat. The pulpit is of carved stone, and on the north side, and the font is of the same material, upon a grey granite step. There are encaustic tiles from Lugwardine, Herefordshire, in the chancel and sanctuary floors, and under the seating, which, like the stalls, are of oak, the floors are of wood blocks. The eagle lectern is of oak. The floor of the organ chamber is somewhat lower than is the nave, and is laid with wood blocks. The contractors for the general work are Messrs. Britton & Pickett, builders, of Ilfracombe. The pulpit, altar, screen, font, &c., as well as the sculptured reredos, and other sculpture, are by Messrs. Harry Hems & Sons. The architect is Mr. John Norton, of London.

CATHOLIC CHURCH, FRIZINGTON, CUMBERLAND.—The new church of St. Joseph, Frizington, was opened recently. The new building, which is in Gothic style, stands on the same site as the old one, and is built of brick. The length of the building is 75 ft., the breadth 34 ft. across the body of the church, and 45 ft. across the altar part; the height to the eaves, 14 ft. 6 in., and from eaves to ridge, 17 ft. 6 in. It is lighted by six windows on each side, and three lancet windows in the north end. Over the vestry on the west of the building is the belfry, 35 ft. high. The church is entered by a porch, with side doors. Over the entrance is an organ gallery. There are two passages leading up the church to the sanctuary, which is entered by three arches—a large one in the centre, 25 ft. 6 in. high and 18 ft. wide; and a smaller one on each side of it. There is seating accommodation for 400 people, the seating being of pitch pine. The lady altar and baptistry are on the left of the high altar; and the vestry is on the right, having an entrance from the adjoining presbytery. Mr. Robert Pearson, of Cleator Moor, prepared the plans, &c., for the erection of the building, and the work was carried out under his supervision. The woodwork was sub-let to Mr. Martindale, and the plumbing work to Mr. Jackson Sumpton. Mr. Millican had the painting; Mr. John Hazzard, Frizington, had charge of the hauling; and Mr. Reuben Pearson had charge of the mason work. The high altar has been executed by Messrs. Boulton & Sons, Cheltenham.

NEW BATHS FOR MORLEY.—The Morley Corporation have decided to erect a set of public baths in the borough. The site selected for the purpose is a sloping piece of ground fronting on to Fountain-street. Out of the fifteen plans submitted in the recent competition, those sent in by Messrs. Holtom & Fox, of Dewsbury, have been awarded the first premium, subject to a tender for the execution of the work at 6,000*l.* (the amount of their estimate) being submitted and approved. In the centre of the front elevation, where the bath superintendent will have his home, the building is to be two stories high; the rest of the structure will be a single story. There will be two entrances to the baths. On the left will be the men's slipper baths—two first-class and four second—two shower baths, a needle bath, and a vapour bath. A visitor to the first-class swimming bath will also enter by this door, and, passing the pay office, beneath the superintendent's house, will turn along a short corridor to the left, where he will find the direct entrance to the bath-room. The length of the first-class bath will be 65 ft., the breadth 24 ft., and the depth will vary from 3 ft. to 6 ft. The entrance on the right-hand side of the building will lead to the ladies' slipper baths, of which there are to be a similar number to those provided for men. Behind these baths will be the second-class swimming bath of the regulation dimensions (water measure)—viz., 75 ft. by 30 ft. As this bath will often be used for entertainments, a gallery has been provided, running the greater part of the way round the room. Dressing boxes of wood, with slate partitions, are to be arranged on two sides of the room. Both of the swimming baths are to be lined with glazed bricks, and adjoining each will be a small soap bath.

SCHOOL OF ART BUILDING, GLASGOW.—Twelve architects were invited to compete in the competition for a School of Art at Glasgow, and the

result was that the design of Messrs. John Honeyman & Keppie was chosen. The site purchased by the Bellahouston Trustees is that piece of land lying immediately to the north of the Panorama buildings in Sauchiehall-street, between Dalhousie-street on the east and Scott-street on the west, and having a frontage to Renfrew-street. The building itself will face due north, with a length of 250 ft. and a depth of 77 ft. Owing to the conformation of the ground, the building at its south-west angle will have to be carried by a retaining wall. The plans selected show a three-storied building—a basement and two floors—the ground to the north being excavated to form an area for lighting the lowest floor. The entrance is in Renfrew-street, the main door being situated in the centre of the façade. A service door has also been made in Dalhousie-street for access to a janitor's house and for the reception of material. The staircase of the building is situated in the rear centre, and access to all floors is gained from and by it. The upper floor contains the life rooms (male and female), antique rooms (elementary and advanced), a school museum, and a board room. The middle floor is occupied by ornament, still life, and design rooms, and the school library and lecture theatre. The basement holds the accommodation for modelling (large antique and ornament), architectural rooms, and the technical rooms. In these will be placed a forge, a kiln, and a muffle. The basement also contains a house for a resident janitor, the heating apparatus, and various store-rooms. The administration is situated in the centre of the building and on the first floor. All rooms in which instruction is to be given are lighted from the north, the only light taken from the south being that available for the corridors, which on each floor run from one end of the building to the other, at the southern side of the edifice. The light from the south is obtained by the use of wells, there being no reservation in favour of windows in the southern wall. The governors are at present contemplating building such portion of the plans as can be erected at a cost of 14,000*l.*

NEW MASONIC HALLS, SELKIRK.—The new Masonic Halls at Selkirk were consecrated on the 19th inst. The halls are situated in the Back Row, adjoining the Volunteer Hall. The principal hall is situated on the second flat, and measures 35 ft. by 20 ft. The under hall is smaller, measuring 25 ft. by 20 ft. M. Hippolyte J. Blanc, Edinburgh, is the architect.

VILLAGE HALL, KNOWSLEY, LANCASHIRE.—Lord Derby recently opened a village hall at Knowsley village. The building was designed by Mr. Leslie, architect on the Derby estate. It contains a hall 60 ft. long (or 75 ft. including the platform) 30 ft. broad, and 37 ft. high to the roof ridge. The roof is of open pitch pine. A gallery occupies one end of the hall, which is seated for 440 persons. There are several cloakrooms, and at one end of the building is a room 30 ft. by 20 ft., with separate entrance door, for the use of the parish council and for small gatherings.

NEW POOR-LAW BUILDINGS, WHITBY.—Some time since the Guardians of the Whitby Poor-Law Union purchased the riverside property in Church-street, Whitby, formerly known as the Phœnix Rooms, for use as a board-room, offices, &c. For nearly a year internal alterations have been in progress, and the interior now contains accommodation for the Guardians and their clerk, also for the Overseers and their assistant, the Rate Collector, Relieving Officer, applicants for relief, &c. The architect for the works of renovation and improvement was Mr. E. H. Smailes, of Whitby, and the contractor Mr. J. Braim.

THE NEW CHURCH AT BOLSOVER, DERBYSHIRE.—A public meeting was held at Bolsover recently to consider and decide what steps should be taken towards the restoration of the church, which was destroyed by fire a few weeks ago. Mr. Louis Ambler, of London, who is the architect engaged, submitted plans which he had prepared. There were two schemes suggested:—No. 1, to erect a building on the same lines as the old one, the estimated cost of which was 6,500*l.*, including seating, gasfitting, organ, bells, and other requisites. No. 2 scheme provides for some enlargement and extra seating accommodation for 220 persons. The estimated cost in this case was 9,000*l.*, inclusive. Both estimates included the cost of restoring the chancel. It was resolved that No. 2 scheme be adopted.

FREE PUBLIC LIBRARY, LEYTON.—The old public offices of the Leyton Local Board have been renovated and altered so as to render them suitable for the purposes of a free library. The alterations on the ground floor provide a lending library, reference library, librarian's office, and store-room. There is a new public entrance. On the first floor the old Board-room has been converted into a reading-room, with a lift connecting the lending library. The second floor, with two rooms on the first floor, comprise the librarian's apartments, with bath-room, &c. The work has been done by Mr. Coxhead, of Leytonstone, from plans by Mr. Dawson, the Surveyor to the Council. The electric lighting has been carried out by Messrs. Spagnoletti & Crooks. The newsroom of the library, which is the old council chamber transformed, is a hall, 50 ft. by 31 ft.

SANITARY AND ENGINEERING NEWS.

REFUSE DESTRUCTOR FOR YARMOUTH.—An inquiry was held at Yarmouth recently by Colonel A. G. Durnford, R.E., with reference to the proposed expenditure by the Town Council of 10,500*l.*, on the erection of a refuse destructor on the Corporation marshes, between Caister-road and the River Bure. The Borough Surveyor, in the course of his evidence, explained that the estimate was as follows:—Building 3,156*l.*; chimney, 1,913*l.*; fencing, 204*l.*; ten furnaces, two boilers, and other appliances, 3,368*l.* 15*s.*; charging apparatus, 1,000*l.*; clinker furnaces, 100*l.* The steam generated would be used for the production of electric light. The quantity of refuse guaranteed to be destroyed without forced draught was 75 tons per day, and the quantity collected in the district which the destructor was to serve averaged 65 tons daily. The maximum in the summer time was 85 tons in a day, and he expected the destructor would work up to 85 tons. The building would afford room for extension, as it was intended for fourteen cells.

DRAINAGE OF SIDMOUTH.—Mr. W. A. Ducat, of the Local Government Board, held an inquiry at Sidmouth on the 24th ult., into the Urban District Council's application to borrow 5,000*l.* for works of sewerage. The Clerk having detailed the facts leading up to the application, stated that the town was now unanimously in favour of Mr. Mansergh's scheme. The Local Government Board had sanctioned a loan of 3,824*l.* for the town sewers, the present application being in regard to the outfall works. Mr. G. R. Strachan (Messrs. Mansergh & Strachan) explained the plans.

PROPOSED DOCK WORKS, THE HARTLEPOOLS.—At a recent meeting of the representatives of the Hartlepool and West Hartlepool Corporations, the Shipowners' Society, and the Chamber of Commerce, held at West Hartlepool, to consider certain proposals for improving the dock and trading facilities of the port, the Mayor of Hartlepool (Councillor Mudd, C.E.) laid a scheme before the meeting, which it is proposed to urge upon the North-Eastern Railway Company to carry out. The project includes a proposal for straightening the deep-water entrance to the harbour; a new fish harbour; a new entrance to the Victoria Dock, 65 ft. wide and 26 ft. deep, to accommodate ships up to 6,000 tons; to heighten and improve the coal spouts; to construct a new dock in the Stake; to enlarge the Central Dock, so as to enable vessels of 600 ft. to be built and launched; to widen No. 4 Graving Dock, so as to accommodate an ironclad, if required; to lay the Jackson Dock to the coal dock, and to construct a new through railway station at West Hartlepool, with main entrance opposite the Municipal Buildings, and make Hartlepool the terminus for south trains.—*North-Eastern Gazette.*

WATER SUPPLY WORKS, WITNEY, OXFORD.—Mr. W. O. E. Meade-King, M.Inst.C.E., an inspector from the Local Government Board, held an inquiry at the Witney Corn Exchange with reference to the application of the Urban District Council to borrow 5,000*l.* for water supply works. Mr. Lailey, the Engineer, attended, and explained the proposed scheme.

SEWAGE DISPOSAL WORKS, KNARESBOROUGH, YORKSHIRE.—An inquiry was held recently at the Urban Council offices at Knaresborough by Colonel Luard, R.E., one of the Local Government Board engineer inspectors, as to the application of the Knaresborough Urban District Council to borrow a further sum of 1,800*l.* for the completion of the main outfall sewerage and sewage disposal works, the total cost of which amounts to 10,000*l.* The Engineer, Mr. D. Balfour, of Newcastle-on-Tyne, explained the scheme, which consists in the laying of two main outfall sewers, both 18 in. in diameter, with a total length of four miles, crossing under the River Nidd by a cast-iron inverted syphon. The disposal works consist of ten acres of land, properly underdrained, and laid out on the intermittent filtration principle. The sewage, on reaching the site, is treated in a chamber with alumino ferric, and, after being thoroughly self-admixed, passes into large precipitation tanks in duplicate, the clarified sewage afterwards passing on to the land. There was no opposition to the scheme.

STAINED GLASS AND DECORATION.

WINDOW, DONCASTER PARISH CHURCH.—The great north transept window in the Doncaster Parish Church, which was destroyed by a gas explosion some time ago, has been filled with new stained glass illustrative of the "Te Deum." The six main lights are filled with three tiers of figures representing Cherubim and Seraphim, apostles, prophets, and martyrs, as well as Saints Ambrose and Augustine, the joint authors of the "Te Deum." The figures are surmounted by canopies of broad and simple design, and along the base of the lights is written in bold black letters, "Te Deum laudamus, te dominum confitemur." The Mowbray window on the south side has been replaced by three lights, containing figures of holy matrons. The whole of the work has been designed and carried out under the direction of the architects (Messrs. Demaine & Brierley, York), by Messrs. Shrigley & Hunt, of Lancaster and London.—*Yorkshire Post.*

MEMORIAL WINDOW, ALLESLEY CHURCH, COVENTRY.—A new stained glass window has been placed in the north wall of Allesley Church, in memory of the late Mrs. James Maycock, of Coventry. The subject is one suggested by the last chapter of Proverbs, describing the virtues of "The Good Woman." The window has two lights. It was designed by Messrs. Ward & Hughes, London.

FOREIGN.

FRANCE.—The Paris Municipal Council is studying the possibility of establishing an evening museum for workmen who are working in industrial arts. This museum will for the present be installed in the Salle Saint Jean, at the Hôtel de Ville, and the present Director of Fine Arts, has promised to give a set of models of ancient and modern works, drawings, and other works of art, to fill the museum. If this scheme succeeds, other evening museums, accompanied by lectures on industrial art, will be organised in the principal mairies of Paris, particularly in the most crowded neighbourhoods.——The Académie des Beaux-Arts has just elected, as foreign corresponding member in the painting section, M. Maccari, of Rome, in place of the late M. de Fonséca, of Lisbon.——The sale of sculptures, furniture, and works of art of the thirteenth century, belonging to the heirs of the brothers Goncourt, has now realised the sum of 182 000 fr. The Chinese and Japanese collection will be sold from March 8 to 13.——The work of suppressing the last of the waterways to be found in Paris is being carried on. These are in the XIV. and XV. arrondissements, on the line of the Compagnie de l'Ouest. The expense is estimated at 5,000,000 francs.——The Poissy Municipal Council has decided to pull down the old mill, close to the Poissy bridge. It was built in 1230 by Queen Blanche of Castille, mother of Saint Louis. This ancient building is now in ruins.——A competition has just been opened for the building of a Palais de Justice at Tizi-Ouzon, in Algeria.——The Municipal Council in Algeria have accepted the scheme for the building of a new Hôtel de Préfecture.——Some important alterations in the town of Marseilles are shortly to be begun. The expense is estimated at 8,000,000 francs. The work is to include the draining and rebuilding the quarters behind the Bourse, between the Rue de la Canebière, Rue de la République, Rue Colbert, and the Cours Belzunce.——Madame Viollet-le-Duc, widow of the great architect, has just been buried in the cemetery at Passy; she died at Saint Germain at the age of 84.——The death is announced, at the age of 57, of M. Albert Lecoy de la Marche, sous chef de la section historiques des Archives Nationales. Several works on French art are due to him; amongst them "Études sur l'académie de France à Rome," studies on miniatures in France in thirteenth and fourteenth centuries, on the art of illuminating and on religious painting.——The painter Frédéric Lix has just died at the age of 67, after a long illness. He was born at Strasbourg, and came to Paris in order to work in the studios of Drolling and Biennoury. This artist gave himself up at the same time to painting and illustration. As a painter he left pictures depicting Alsacian life, "La Marseillaise en Alsace," "Les Adieux à la Patrie," and historical subjects, such as "Camille Desmoulins au Palais Royal," and "Un drame au Moyen Age," which was exhibited last year at the Champs Elysées salon. His illustrations are innumerable.——The death is announced of M. Jules Louis Bertrand, architect, of Valenciennes, at the age of 60.

GERMANY.—The *Deutsche Bauzeitung* report that the large national monument which is to be erected at Leipsic will be designed by Bruno Schmitz, and that there will be no further competition for this work.——Seventy-four designs have been sent in for the new palm-houses and gardens for Leipsic, and the first premium of 150*l.* has been awarded to Mr. Edward May, of Frankfort.——A publication has been issued of illustrations of buildings carried out from the designs and under the supervision of Professor Messel, of whose work we have frequently given illustrations.——A memorial tower is to be erected in honour of the ex-Chancellor Bismarck. A competition has been opened for the design, and Professors Ende, Schwechten, and Otzen are the assessors. The locality for the tower is Apenrade in Schleswig.——An interesting series of competitions has been opened by the East Prussian Architectural Society, with a view of obtaining a series of model designs of villa-residences. There are five competitions, each for a different class of building. Competitions of this description should do much to encourage better planning in the smaller German towns.——The "Kreuz Kirche," at Dresden, was destroyed by fire recently; it has only been lately renovated in the interior at an expenditure of 15,000*l.* The building dates back to 1764. It is understood that the church was insured for 75,000*l.*——We regret to record the death of Herr Baurath Krankce, at the age of seventy-seven; he was long associated with the railway works of the Prussian Government, and his life is the subject of a long obituary notice in our contemporary, the *Central Blatt der Bauverwaltung.*——We regret to record the death also of the well-known cathedral architect, Max Salzmann, who has long been associated

with the Dome at Bremen, the restoration of which was placed in his hands after an important competition held in 1888. Herr Salzmann had only attained his forty-seventh year, and was considered to be one of the most prominent church architects in Germany.——The Association of Brickmakers and Limekiln Owners held its annual meeting at Berlin last month, and at the same time the meetings of the cement manufacturers also took place. As usual at these gatherings, a number of highly interesting lectures were given, and there was much discussion on technical questions of the day.

AUSTRIA.—The Architects' Ball which took place at Vienna last month is considered to have been a great success. Among the visitors was the Archduke Otto of Austria. Professor Otto Wagner was the President of the ball. The Prime Minister was present among other political personages.——According to our official contemporaries at Vienna it appears necessary to extend the premises of the Great General Hospital by using the site of some historical barracks. The matter will come before the Austrian Parliament during the present year.——A small section of the Vienna horse tramways has been transformed into electrical tramways with a view of giving this system a trial,——The Continental Gas Company at Vienna has just entered into a contract for 15,000 incandescent gas lights for street lighting.

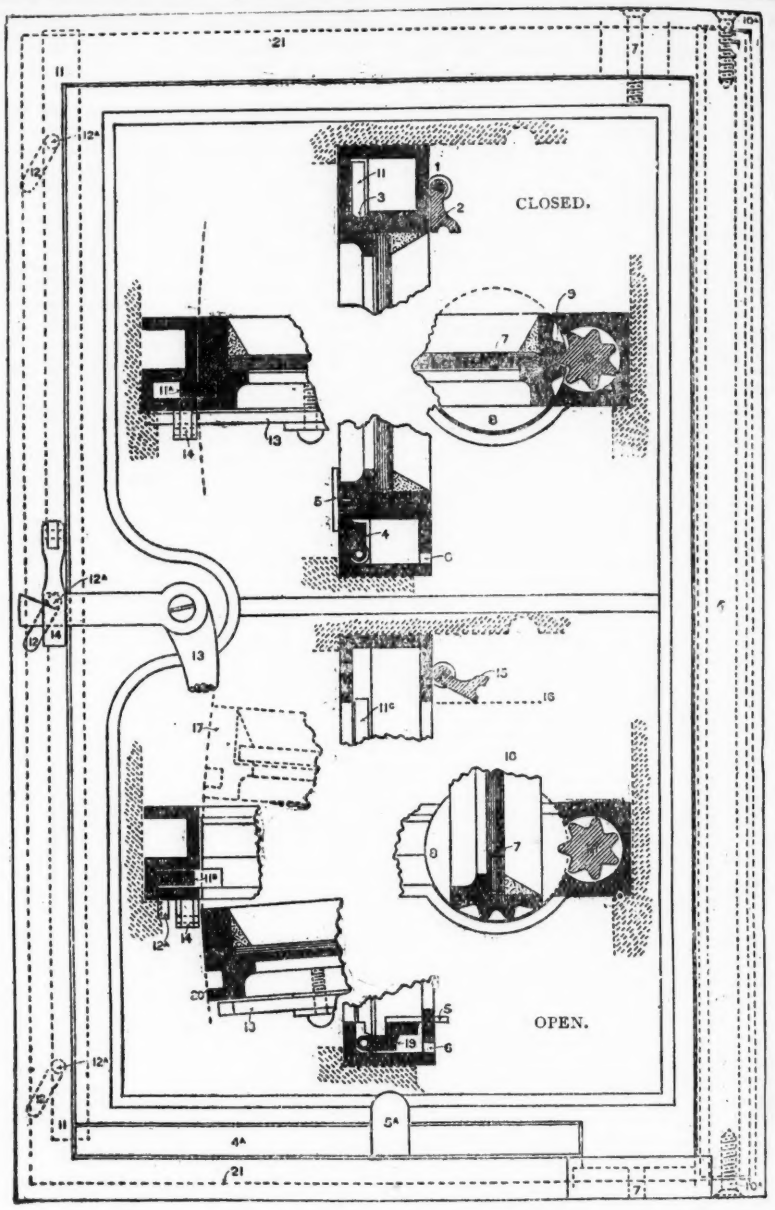
A FIRE IN THE CATHEDRAL AT VERONA.—The ancient cathedral of Verona has had a narrow escape from being destroyed. As it is, damage to the amount of 4,000*l.* has been done, which is covered by insurance; but the old registers in the vestry, some of which dated back to 1503, the altar furniture of gilt wood used on ceremonial occasions, the wax candle offerings at shrines of the past month, objects in silver of the Santa Anna Company, and other furniture were burnt. Fortunately all the most precious objects escaped destruction. The flames were first seen to issue from a window of a room in the building called "De la Cioccolàta," because of its serving as a refreshment room for the neophytes.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Lumleys, of 22, St. James's-street, have instituted monthly sales by auction of shares in trading, manufacturing, gas, water, insurance, and other companies, which do not usually find a market on the Stock Exchange.——Messrs. W. & J. R. Freeman, stone and granite merchants, have opened a new depôt in the Great Northern Railway Goods Yard, King's Cross.

GREENWOOD'S TIMBER CALCULATOR.—This is a card to enable the prices of small-sized timber to be determined at a glance, by showing what a certain price per foot cube amounts to per linear foot in various scantlings of timber. The widths and thicknesses are given in cross columns, and the price per linear foot is found at the intersection of the width and thickness columns. The card is arranged so as to apply to twelve different prices per standard and per foot cube. It is likely to save a great deal of labour in computing prices of small timber in estimating, taking out quantities, &c. There should have been some indication on the face of the tables, however, to show that the central columns represent pence and fractions of pence, which is not immediately apparent, though it is sufficiently to be gathered from the explanatory note on the back of the card. It is sold by the inventor, Mr. Harry Greenwood, Mansfield.

AN IMPROVEMENT IN METAL CASEMENTS.—An improvement in the method of manufacture of metal casements, with special regard to the new feature by which the metal casement can be made to open either inwards or outwards, is worth the attention of architects. Formerly there were, as is well known, two kinds of ordinary casements, the one opening outwards and the other inwards. The former is the more usually adopted by architects, but it has the disadvantage of being difficult to clean from within, and when it is adopted in a series of mullions it is necessary that many more are supplied with fittings to open than are actually required. The casement opening inwards, on the other hand, while being easy to clean from the room, has the disadvantage of only being weather-tight at an extra cost, especially in exposed situations, and also interferes with blinds, window drapery, &c., whenever opened for ventilation. The improvement noted above consists in a patent, which has been taken out by the N.A.P. Window Company, of Victoria-street, S.W., by which each casement opens both inwards and outwards. This is effected by various methods, one of which is illustrated in order to explain the system. This is known as the "slip" patent. The border shows the interior elevation, and the plans and sections of the casement when closed and open are shown respectively in the upper half and lower half of the window; the slip or tongue (11), is projected by the handle into the groove when the casement is fastened, thereby making a perfectly weather-tight joint for the closing style. On referring to the other parts of the window in the illustration, it will be noticed they are rendered water-tight in the following manner:—The corrugated rod (10), which is pivoted top and bottom, revolves as the casement is moved either inwards or outwards, the teeth being in juxtaposition form a close joint. The joint between the head of casement and frame is effectively covered by the automatic bar (2), the action of which is shown in the upper and lower illustrations. The arrangement of the water bar (4) appears simple and effective. The casement is in use at the new Cripplegate Institute, and is about to be used in several buildings in London. The cost appears to be slightly in excess of the ordinary type, but, on the other hand, as fewer casements are required to be opened for cleansing, a saving is effected by this means. The invention, like the other patents taken out by the same firm, deserves our commendation, and we shall be mistaken if it is not largely used by architects in the future.



Details of Metal Casement made by the "N. A. P." Window Co.

REFERENCES TO DIAGRAM.

1. Drip to prevent rain-water passing behind head water-bar.
2. Head water-bar (throated) for automatically rising into position when casement is opened outwards.
3. Condensation groove extending whole length of head.
4. Water-bar which remains in this position for ventilation, but is pushed down by thumb-piece (5, 5a) when it is desired to revolve the casement inwards for cleaning.

4a. Elevation of water-bar.

5, 5a. End and front elevations of thumb-piece.

6. Outlet holes for any water which may get into the sill.
7. Pivots of casement.
8. Turn-table, enabling casement to revolve freely.
9. Corrugations or teeth, extending from top to bottom of glass stile, one of which always engages a corresponding tooth in the revolving corrugated rod (10) when the casement is closed, and thus secures a water-tight joint.
10. Revolving corrugated rod extending from top to bottom of hanging stile.

10a. Pivots of revolving corrugated rod.

11. Slip extending from top to bottom of closing stile, and automatically projected and withdrawn by the closing or opening of the casement handle.

11a. Position (automatic) of slip when casement is closed.

11b. Position (automatic) of slip when released from handle, enabling casement to be moved inwards and outwards.

12. Guides for pins of slip.

12a. Pins of slip—the top and bottom ones being flush with, or slightly below, surface of closing stile, and the centre one projecting and being engaged by notch in latch of handle.

13. Casement handle, the latch of which not only secures the casement in the ordinary way, but also as described in connexion with 11 and 12a.
14. Catch for preventing the latch of casement handle being borne down by the weight of the slip.
15. Position (automatic) of head water-bar when casement is open for ventilation.
16. Top line of casement when open for ventilation.
17. Casement opening outwards for ventilation.
18. Casement fully open.
19. Water-bar down to enable casement to pass inside for cleaning.
20. Casement opening inside for cleaning.
21. Cement line.

APPOINTMENT.—It is stated that Mr. W. Wallace Gandy, architect and surveyor, of St. Helens, has just been appointed, out of about 140 applicants, to the position of chief architectural assistant to the Borough Engineer of Accrington.

SOMERSET HOUSE.—A Portland stone wall at the Embankment side of Somerset House, near Waterloo Bridge, has been erected, the work having been carried out in unison with the prevailing style of architecture of the building. The part thus reclaimed was formerly known as the Dock House, and was in use many years ago as a waterway for the entrance of barges from the river into Somerset House. In addition to the erection of the wall, a large room has been constructed, which will be used as a repository for papers, &c. The work has been carried out under the direction of Mr. Williams, clerk of the works, Royal Courts of Justice.

THE SURVEYORS' INSTITUTION.—The annual dinner of the members of the Surveyors' Institution was held at the Hotel Cecil, Strand, on the 24th ult. Mr. Daniel Watney, the President, occupied the chair, and the company, numbering about 200, included Professor G. Aitchison (President of the Royal Institute of British Architects), Mr. C. Oakley, Mr. R. Vigers. Mr. T. M. Rickman. Mr. A. Garrard, Mr. J. F. L. Rolleston, Mr. A. Buck, Mr. C. J. Shoppee, Mr. A. Vernon, Mr. C. Bidwell, Mr. A. Waterhouse, R.A., Mr. E. Windsor Richards (President of the Institute of Mechanical Engineers), Dr. J. H. T. Tudsbery (secretary of the Institute of Civil Engineers), Mr. A. R. Binnie, and

Mr. J. W. Penfold, hon. secretary. After the loyal toasts the President proposed "The Houses of Lords and Commons." Mr. Jesse Collings, M.P., replied. The toast of "The Bench and the Bar," proposed by Mr. C. Oakley, was acknowledged by Mr. Justice Grantham and Mr. E. J. Castle, Q.C. Mr. G de L. Willis proposed the toast of the evening—"The Surveyors' Institution." He said the Institution was established in the year 1869, and incorporated by royal charter in 1881. The Institution, which was a public authority under the London Building Act, 1894, and other statutes, was now erecting, at a cost of 30,000*l.*, a building in Great George-street for a permanent home. Their membership had risen from 200 in 1869 to nearly 2,800. This year 400 candidates were examined for the Institution certificate. He stated, in conclusion, that the President had provided an endowment of 10*l.* per annum for the best work in the science and practice of forestry. The President responded. The President of the Royal Institute of British Architects and the vice-president of the Royal College of Surgeons responded for the toast of "The Kindred Societies," proposed by Mr. C. J. Shoppee. Other toasts followed.

THE COST OF LONDON BOARD SCHOOLS.—On February 17 last, the Works Committee of the London School Board appointed a Special Sub-Committee to inquire into the cost of the schools now being erected by the Board. The Committee have now received the general report of this Sub-Committee, and have approved the recommendations contained therein, and at the meeting of the Board on the 25th ult. they submitted the report of the Sub-Committee to the Board for their information, together with the recommendations set out below, which, in the opinion of the Committee, are calculated to effect a reduction in the cost of the schools to be erected in future:—"That the Board revert to the old specification in force in 1885-6 for all future schools and enlargements (as suggested by the Architect of the Board) subject to such modifications as the Architect may think it necessary to make, in order to bring the specification up to the present requirements of the Board and the Education Department; and also subject to the further recommendations which are made by the Sub-Committee (see pages 11 to 15 inclusive of the report). That, in future, the brickwork of all piers carrying heavy loads, and also the whole of the external walls, be built in cement, and that internal walls generally be built in mortar. That, in future, the amount which is included in the builder's tender for the supply of glazed brick internal facings be shown on the form of tender as a separate item. That in all building contracts entered into by the Board in future, the quantities shall not form part of the contract. That, in the case of the next six schools erected by the Board upon which the Board's Measuring Surveyor has not commenced any measuring work in connection with the foundations, drainage, &c., the experiment be tried of having the variations on the contract measured up on completion, and the accounts adjusted, by the Quantity Surveyor who took out the original quantities, such adjustment to be completed within a period of six weeks after the completion of the school. That the terms upon which this additional work shall be executed, be the subject of a special arrangement between the Board and the Quantity Surveyors; and that a report be subsequently submitted to the Works Committee showing the comparative cost of the measuring up by the outside Quantity Surveyors, and also by the Board's Measuring Surveyor. That the Quantity Surveyors be required to furnish the Board with all the details and abstracts of their measurements, and also the detailed accounts showing the actual cost of the additions and omissions, for reference if necessary, together with a Summary and Balance Sheet. That, in the above six selected cases, the Architect of the Board be instructed to make the necessary arrangements for measuring the foundations, drainage, &c., during the progress of the work (as has hitherto been done by the Board's Measuring Surveyor), but that the monthly valuations of the work done (upon which certificates for payment are given to Contractors during the progress of the work) be made by the Board's Measuring Surveyor as at present." A long discussion took place on the subject, and Mr. Diggle reviewed the building policy of the Board at length, and moved that the report go back for further consideration. This was lost by 19 to 18, and a motion (the "previous question") by Mr. Riley, was also negatived; but subsequently a motion to adjourn the debate was adopted.

BERKHAMSTED SCHOOL CHAPEL. — In reference to our comment on Dr. Fry's letter in our last issue, we have been since informed that the executed design was not chosen as the result of a competition, as the phrase "finally accepted design" led us to suppose. Of course in that case our comment on that phase of the matter was not applicable, and we withdraw it.

GESSO.—On Tuesday evening Mr. Matthew Webb gave an excellent practical and critical lecture on "Gesso" at the rooms of the Society of Arts, in connexion with the Applied Art Section. Admitting that it was sometimes not easy to draw the line between stucco and gesso, he thought it was roughly true that gesso was for the brush and stucco for the modelling tool; though the laying on of gesso was, as he showed experimentally, not so much brush-work as allowing a material to drip from the brush in the line it followed. In the substances usually employed by the gesso worker, all the binding, hardening, and cohesion was given by the hardening of glue and oil; in stucco those ingredients might be injurious. It was the difference between carbonate and sulphate of lime, calcium being the metallic basis of both. In gesso proper, whitening or chalk was used, the carbonate, which might be washed away by water; in stucco the sulphate was used, such as plaster of Paris, which would set under water. The various technical difficulties of gesso work were minutely described, and a good many examples exhibited illustrating various points in regard to both the practical nature and artistic use of the material.

THE HISTORY OF THE ARCH.—The ninth of the series of fortnightly lectures at the Glasgow Corporation Galleries on art subjects was delivered recently by Professor F. M. Simpson, of University College, Liverpool, whose subject was, "The History of the Arch." The lecturer began by saying that although the lintel form of construction was older than the arch form, the latter was more ancient than was generally supposed. It was known to and used by the Egyptians 3,000 years before the birth of Christ. The most interesting discovery had been that of the gates of Khorsabad, in Assyria, which dated from 721 B C. Both the pointed and semicircular-headed forms were used by the ancients, although the former shape was generally not constructed with radiating voussoirs, but with stones projecting one in front of the other, the joints being horizontal. The godfathers of the arch were really the Etruscans. From them the Romans learned it, and used it universally in their buildings. All the Roman arches were semicircular, and were constructed on true arch principles. So were the arches used by the Byzantine and Romanesque builders. The pointed form reappeared in the Saracenic work of the ninth and tenth century, and was adopted by the mediæval architects to solve certain difficulties in construction—principally those of vaulting over oblong spaces. It was constructed properly with radiating voussoirs, but the old idea that the Gothic men invented the pointed arch was a mistake. At the end of the fourteenth century the arch became again semicircular, and this continued until the Gothic revival at the end of the last century once more brought the pointed form into fashion. The lecture was illustrated with a fine series of lantern slides.—*North British Mail.*

PRESENTATIONS AT AN ANNUAL TRADE DINNER.—The third annual dinner of the heads of departments and representatives of the firm of Messrs. Young & Marten, which took place at the Holborn Restaurant, on the 20th ult., coincided with the 25th anniversary of the firm, and was made the occasion for presentations to Mr. H. H. Marten, the head of the firm, and to Mr. E. M. Edwards, the manager, who each received a testimonial in the form of a piece of silver plate with an appropriate inscription. Mr. B. Carter, in making the presentation to Mr. Marten, congratulated him upon the attainment of the 25th anniversary of the business. Those present were glad of the opportunity of thanking Mr. Marten sincerely for the great kindness and consideration which he had extended to them continually. Mr. E. Montague Edwards, who occupied the vice chair, next proposed the toast of "The Firm," and coupled with it the name of Mr. H. H. Marten, the proprietor. Mr. T. B. Lupton (manager of the Leytonstone Branch) subsequently made the presentation to Mr. Edwards, congratulating him on the position he had gained, and the share he had had in the practical management and development of the firm for twenty-three years.

DESIGNS FOR INVITATION CARDS, OPENING OF BLACKWALL TUNNEL.—The Bridges Committee of the London County Council are prepared to offer prizes: one of five guineas, one of two guineas, one of one guinea, and seven of ten shillings, for designs in black and white, or in any one colour, for a card of invitation to the ceremony. The designs must be upon thick card, not larger than 12 in. by 8 in., and may, if the competitor please, embody a section of the tunnel, illustrations of which will be sent to intending competitors on application to the Secretary of the Technical Education Board. The prizes will be adjudicated by the art advisers of the Board, and all designs must be received by the Board's Secretary not later than Thursday, March 25. Students in any of the London Schools of Art, or in any of the classes conducted or aided by the Technical Education Board, will be eligible to compete.

CARPENTERS' HALL LECTURES.—A very interesting lecture on the Work of the Electric Current was given by Dr. Fleming on Wednesday evening. Numerous lantern illustrations were shown, and his method of projecting experiments on a screen is a great improvement on the older method of showing them on the lecture table. For example, he projected the mechanism of an electric bell on the screen, and then very clearly explained its action. To illustrate electro-plating, a lead fork was shown on the screen being rapidly coated with lead; as the current was too strong he compared it to a labourer bringing bricks too quickly, so that heaps of loose bricks were soon piled up round the bricklayer. He pointed out that the electrolytic production of aluminium was now a great industry. A few years ago it cost several shillings an ounce, now it could be bought for 1s. 9d. a pound. He prophesied that it would soon be as cheap as copper, and that then aluminium ships and girders would be made. The great progress of electric lighting was proved by the fact that the number of lamps connected in London had doubled within the last three years. In the United States, he said that there were 10 000 miles of electric tramroads working, and that the capital expenditure on electric traction was now over fifty million pounds. He mentioned that all the great practical applications of electricity had sprung out of pure scientific research, and made an eloquent appeal on behalf of pure scientific work as the basis of all advance in the arts. Lord Reay, who took the chair, expressed a hope that the Government would accept the proposal for a National Physical Laboratory, and endorsed Dr. Fleming's remarks on the importance of the search for the truth concerning the forces and mysteries of the world in which we live.

PROPOSED PORTRAIT OF THE EX-PRESIDENT OF THE INSTITUTE OF ARCHITECTS.—The Council of the Royal Institute of British Architects, in furtherance of what they believe to be a very widely-spread wish, have appointed a Committee to take such steps as may be deemed advisable to obtain a portrait of Mr. Francis C. Penrose, F.R.S., to be hung on the walls of the Institute, in recognition of his distinguished services in the cause of architecture, and the admirable manner in which he filled the office of President during the years 1894-96. Subscriptions are invited from members of the Institute. The names of the Committee are Messrs. L. Alma Tadema, Ernest George, Alex. Graham, Ed. W. Mountford, and A. S. Murray.

CAPITAL AND LABOUR.

WAGES IN THE COVENTRY BUILDING TRADE.—At the end of last year the various branches of the building trade in Coventry, except the painters, applied for an increase of wages, and in some cases for alterations, some of an important character, to the working rules. The bricklayers, masons, plasterers, plasterers' labourers, scaffolders, and carpenters and joiners, asked for an increase of 1d., and bricklayers' labourers ½d. per hour. The Master Builders' Association, in reply, offered the men half the advance they asked, and in regard to the rules made several concessions, refused demands which they considered ought not to be made, and suggested a few alterations, merely with a view to bringing about uniformity on certain points. The workmen, however, have indicated an unwillingness to accept the financial proposals of the Association, and the replies of some of the societies ignore the attitude of the masters upon the question of suggested alterations to rules. The workmen have agreed to appoint delegates to meet the masters to discuss points upon which there is disagreement, and questions that remain unsettled will go to arbitration. The masters are anxious to meet the men as far as possible, believing, under the circumstances, that they are entitled to some improvement in their position. But they are of opinion that a 1d. increase is excessive, and that some of the proposed alterations to the rules would have a consequence disagreeable to both employers and employed. While desiring to act justly to the men, they think it only right to consider the conditions of employment prevailing in the district. In some Warwickshire towns the workmen engaged in the building trade get considerably less than is being received in Coventry, and the concession of such a large advance to workmen, in comparison already most favourably circumstanced, the masters believe might work unfortunately for both parties. In view of the activity in the building trade everything will be done to facilitate a speedy settlement of the dispute, and it is thought unlikely that anything will arise likely to prevent a mutually satisfactory conclusion.—*Coventry Herald.*

THE BRICKLAYERS' AND PLASTERERS' DISPUTE, NEWCASTLE. — The dispute which has existed for more than twelve months between the bricklayers and plasterers, as to which set of tradesmen should do certain cement work, has at last been brought to a termination. Several attempts have from time to time been made to effect a settlement. Recently, at the invitation of Mr. J. W. Dyson, architect, representatives of all the parties to the dispute, together with some of the leading architects, met at the County Hotel for the purpose of discussing the matter in a friendly spirit. At this meeting a suggestion was made by Mr. R. J. Leeson that two architects, two master builders, two plasterers, and two bricklayers should meet in a round-table conference for the purpose of discussing seriatim the items in dispute. This was unanimously adopted, and the following gentlemen were selected as representatives, viz.: — Messrs. J. W. Dyson and R. J. Leeson, architects; Messrs. Walter Lowry and S. B. Burton, master builders; Messrs. Hope and Drummond, bricklayers; and Messrs. Young and Carron, plasterers. The result has been that a detailed schedule has been agreed upon, defining the particular class of work to be done by each trade. The representatives of the trades and also the master builders have submitted the schedule to their

different societies, and in each case it has been adopted and approved. A further outcome of the conference has been that the gentlemen forming it have been asked by the societies and master builders to act for one year as a Conciliation Board; this they have consented to do and it has been agreed that all questions in dispute as to cement work should be referred to them for final decision.—*Newcastle Chronicle.*

THE BUILDING TRADE IN GLASGOW.—For some time past the building trade in Glasgow and district has been on the boom, but the zenith seems now to have been reached and a tendency towards decline is beginning to be observed. There is as yet nothing like slackness, but the future prospect is not so brilliant as it was a twelvemonth ago. Wages at present are pretty good. Masons, bricklayers, and joiners are being paid at the rate of 9d. an hour, with ½d. an hour extra for travelling, &c., expenses, when engaged in outlying districts. The joiners are not satisfied with this, and have just sent in an application for ½d. an hour advance, which the masters will have to take into consideration. Plumbers have been in receipt of 8½d. an hour, and they are pressing for an increase of 1d. Their demand will be discussed shortly at a joint conference.—*Glasgow Evening Citizen.*

LEGAL.

THE CLAIM AGAINST THE ST. PANCRAS GUARDIANS.

MR. EDWARD RIDLEY, Q.C., the Official Referee, on the 1st inst. resumed the hearing of this claim. The plaintiffs, who are builders' merchants, sue (as trustees of creditors of Mr. Wm. Brooks, builder, of Folkestone), the Guardians of the Poor of St. Pancras and their architects, Messrs. A. & C. Harston, for a balance of 24,226*l.*, or, alternatively, 24,262*l.*, alleged to be due on a contract for the completion of the St. Pancras workhouse. The plaintiffs' case is that some years ago the Guardians resolved to reconstruct the workhouse in King's-road, and appointed Messrs. Harston as their architects. The contract for the work was first taken by Messrs. Kirk & Randall, of Woolwich, but disputes arose, and, in 1892, that firm requested to be relieved of further work under the contract. Fresh tenders were invited for the unfinished work, and that of Mr. Wm. Brooks was accepted for 50,861*l.* The work was to occupy fifteen months from May, 1892, but delays arose, and in November, 1894, the work was stopped. Messrs. Drew-Bear, Perks, & Co., of Queen Victoria-street, who supplied the ironwork; Mr. H. Tolputt, of Folkestone, who supplied the timber; and Mr. J. Brown, of Cannon-street, who supplied bricks, sued on behalf of creditors for the balance alleged to be due to Mr. Brooks. The net cost of the work executed was stated to be on the first claim 65,479*l.*, plus 10 per cent. profit, 6,547*l.*, making 72,026*l.*, of which 47,800*l.* had been received under the architects' certificates, leaving a balance of 24,226*l.* In the alternative claim the net cost of the work executed was estimated at 65,479*l.* as before, but the 10 per cent. profit was reckoned on the contract price of 50,861*l.*, which, with other amounts claimed, brought the alternative claim to 24,262*l.* The plaintiffs alleged that Brooks was hindered from continuing and completing the contract by the action of Mr. George Poole, the clerk of the works, who interfered without sufficient cause, and condemned materials supplied wholesale. It was also further alleged that the architects were seldom on the works, and that the interference of the clerk of the works caused needlessly a net loss to Brooks of 2,526*l.*, in addition to 193*l.*, the value of the materials left by Messrs. Kirk & Randall, and not permitted to be used. The defendants generally denied the charges against the clerk of the works, and alleged that Brooks had not carried out his undertaking to complete the work left unfinished by Kirk & Randall. The Guardians further relied on the Public Authorities Protection Act, 1893, as being a defence, inasmuch as the matters referred to in the action occurred more than six months before the action was brought. Messrs. Harston, the other defendants, pleaded that they were not liable, and said that they had received no complaints from Poole with respect to the manner in which the works were being carried out by Mr. Brooks. Reports of the former proceedings have appeared in the issues of the *Builder* for November 21 and 28, and December 5, 1896, and January 23 and January 30 last.

Mr. Reginald Bray and Mr. A. A. Hudson appeared as counsel for the plaintiffs; Mr. English Harrison and Mr. W. Moyses for the Guardians; and Mr. MacIntyre and Mr. R. W. Turner for the architects.

Mr. Christopher Harston, recalled, and further examined by Mr. English Harrison, said that the flooring for a workhouse required to be of the very best and hardest to stand the wear. It was not like a private house, where the floors were covered with carpets. The floors in a workhouse required to be constantly scrubbed, which was very trying to the floor. Witness stipulated that no sappy boards were to be used for the floors. They wanted about 500 squares for the whole job. Kirk & Randall left about 280. They had seen the flooring left by Kirk & Randall in the stack before making the contract with Brooks. They had, however, neither passed it or rejected it. Witness knew it was sappy, hence his caution in putting the provision relating to sappy boards in the bills of quantities. He had no knowledge of the condemnation by Poole during the time it was in Kirk & Randall's possession. It was part of Brooks' contract to take out the sappy boards which Kirk & Randall had laid. On June 15, 1893, he examined some flooring. Prior to that, he had discovered from Mr. Poole's reports that some objection was being made to the flooring. He examined the flooring on the top floor of "C" Block, when he found a number of boards marked by Poole as being sappy, and they were sappy. He found that the floor was not properly laid or cleaned off properly. He told Fearon that he must take up some of the flooring marked, and that it must be cleaned off and laid properly. Some of the boards were taken up. He had seen the flooring since two or three times. It was in very fair condition now; but still there were a few sappy boards in it, some with as much as an inch of sap in them. That was Kirk & Randall's boarding. It was not true, as Fearon suggested, that he (witness) said that all the boards that Poole had marked should be taken up. He told Fearon that some of them must be. He never told Fearon that he would have to submit to Poole in every detail, and that he would support Poole in everything he did. The objection to sappy timber was that it would not wear, and soon got rotten. Further, it was prohibited in the specification. The witness was next examined as to the old cast iron tank in "K" Block, which had to be taken down and made smaller by removing a tier of plates and putting it up again. The witness said that he examined the plates to see if they were sound, because the specification stipulated that any defective plates had to be replaced by new. He had one of the plates broken to see how far the metal was sound. He came to the conclusion that they were fairly sound, so that he did not ask them to provide any new plates for the tank, and the old plates were used. He did not know that Poole had objected to the plates or tank. Fearon never made any complaint to him about the chipped tank or the way in which the tank had been treated. With reference to the question of the plaster arches in the committee room and the steward's clerk's office, the witness stated that the brickwork was satisfactory, the only complaint being as to a defect in the plastering. That was in October, 1893. Fearon admitted they were defective, and said he would put them right. Fearon made no complaint whatever about the drawing. The defect was that on one side of each arch the curve was broken; there was not a true curve. After the arches were executed by the trammel they were not again condemned. So far as he could he assisted Fearon to get the things right. It was a very simple matter, and Fearon ought not to have required any assistance at all. He had never in thirty years' experience given assistance in such a matter. Examined as to the concrete foundations the witness said that his attention was called to some brick rubbish being used in the trenches. This he considered a very serious thing, as the concrete foundation had to carry the weight of the building. The foundation ought to become a hard, solid mass, but if brick rubbish was put in they were not getting what they paid for. He had known of architects discovering such things many years after a building had been completed, and spending as much as 1,000*l.* out of their own pockets to remedy the defect, for the sake of their own reputations. Witness, examined as to the slates, said that those which came up to the job were of very fair quality. It was not true that he made objection to them, but he did complain about some of them being damaged by careless holing. The ridge rolls he found to be very inferior and bad; in fact, they were not "rolls" at all. That was in March, 1893. The rolls should be rounded, but the ones he objected to were more hexagonal in shape. The screw rolls were wrong there not being sufficient of them. When he objected to those rolls he did so in the exercise of his skill and judgment as an architect. In May, 1893, he saw another lot of rolls on the job, but they were the same as the last. It was not true that he required a better class of goods than was specified. His attention was first called to the galvanised tanks in March, 1893. In April, 1893, he wrote saying that they had better see that the tanks were water-tight before they were hoisted. The tanks were taken backwards and forwards, and then ultimately regalvanised, passed, and used. The tanks were only galvanised once. Four tanks out of seven were objected to. It was perfectly obvious that if the tanks were oxidised or rusty they ought not to go up. In that class of goods rust would extend. He objected to the contractor who ran short of boarding using some of the hoarding stuff on the coach-house roof. As the boards had been in use for hoarding for three years they were in a very dirty condition. In January, 1893, Poole made a communication to him about twenty-seven sashes and frames. He went and saw them in the stores. They were not, in his opinion, in accordance with the specification, but he passed them, and told Poole to say nothing more about them. At the time he saw them in the stores there were some men there, and he was told they were putting right some of the defects. He did make objection to bats being used improperly. He remembered one instance on "H" Block: he found bats, and bats only, being carried up on the scaffold, heaps being on the scaffold, and a number being in the work where they ought not to have been. Very few bats were required in an 18-in. wall. He never made any objection to old bricks being used if they were sound old bricks.

The witness produced specimens of old bricks which he had condemned, and specimens of those which he would have passed, and which were taken from a cart as they were being carted away from the works.

As to the lintels, the witness said that some were fixed too high, and he told Fearon that they must be lowered at once. In such a building he never allowed lath and plaster work, nothing but solid walls, and he, therefore, insisted on solid brickwork all through.

Cross-examined by Mr. Bray: He did not admit that he had erred in this case; if he had done so it was not from want of experience or care. He generally got Poole's reports at the end of each week, and carefully perused them, and went on the works himself about once a fortnight. Witness knew from Poole's reports that a large quantity of materials was objected to. Some of the materials objected to were afterwards used, but witness had a right to allow inferior material to be used after he had expressed his objections, in the hope that next time the contractors would do better. Witness never told Poole not to make so many objections; they were, indeed, proper so far as he (witness) could see. It was quite probable that exactly the same objections were made to the same materials in Kirk & Randall's time as in Brooks's, and very naturally so. There were a great many disputes in every job where Kirk & Randall were employed, but witness only remembered coming in contact with them on one previous occasion. In this case Kirk & Randall asked to be released from the contract, and witness advised the Guardians to do so. He did not know why they objected to go on, but he did know that at the time prices both of material and labour had gone up.

The witness, further cross-examined by Mr. Bray, said he thought it very unlikely that the reasons put forward by Kirk & Randall for claiming recision of their contract was the conduct of himself and Poole. It was a common thing to complain about the clerk of the works. Poole was clerk of the works in Kirk & Randall's time. He nominated Poole, but he did not press for his appointment. He had no recollection that the Guardians wished to get some outside person and advertise for him. He might have probably told the Guardians that he knew Poole, and that he (Poole) had been with them for some time. As witness was arbitrator under the contract, the contractors were, no doubt, to some extent in his hands. Poole would see that the builder did not use materials not up to specification, and the work would be stopped until he (witness) adjudicated upon it. If the contractor had required his attendance at any time, witness would have come at once.

Mr. Bray: Fearon states that on several occasions you told him that he must obey Mr. Poole or you would have the work taken down?—That I deny; I never told him anything of the kind.

Cross-examination continued: If there were salt in the sand it would show itself on the brickwork as a white fur for some months, but witness could not point to any place in the building where the brickwork showed such marks, nor had he seen any. If the sand were salty the walls would be damp in certain conditions of the weather. Witness could not refer to any place where too fine a quality of sand was used; the fact was the fine sand was mixed with coarser stuff and so did not do much harm.

Mr. Bray asked the witness whether he knew that the Guardians were to give possession of the whole of the site at once.

Mr. English Harrison said that that was a question of construction of the contract.

Mr. Bray: No, it is something to do with the fairness of Mr. Harston.

Mr. Harrison: My contention is that the architect is not responsible for an error of judgment, however grievous the mistakes might be resulting therefrom.

Mr. Bray said that he did not contend that he would be. He wished to show that the contractor could not gain possession of a sufficient portion of the site.

Mr. Harrison said that the architect's conduct could only be impugned on an allegation of fraud.

Mr. Bray said that fraud was not alleged in the case.

The learned Referee said that doubtless the architect, as arbitrator, had to exercise his discretion to the best of his judgment, but if his conduct had been such as to render it impossible for the work under the contract to be continued—he did not say it was so in this case—it would support the plaintiff's contention that the contract had been set aside and a readjustment must be made on *quantum meruit.*

Cross-examination continued: Witness did not consider that any unnecessary delay, so far as he was concerned, took place in giving possession to the contractor. He urged the Guardians from time to time to clear the buildings as speedily as possible,

to allow Brooks to get on. Asked as to the iron work, the witness stated that all the iron merchants when asked to supply a girder of an exact weight according to the printed lists, replied asking for time, as they had not that particular make in stock; witness therefore specified for certain sizes and weights "net"—that was actual, not reputed weights. Witness's objections to the rejected columns and "B2" girders were, he maintained, reasonable. He objected to screwing the lugs on the columns instead of them being cast in one piece, because they were not so strong, nor did they look as well. Passing on to the question of brickwork, the witness said he considered the bricks as a whole fair, but he could point out some bad specimens. He did not think the sample of brickwork produced in Court as quite up to the average; it was from the wall of the yard of "H" Block. The stock facing brickwork was as a whole good, although it contained work rejected by Poole. Brickwork might, as a whole, be very good, and yet contain some poor work. Witness heard what Holland and his foreman, George Smith, had said about coming from the Stepney Asylum job in 1893 to St. Pancras to see the brickwork. He would not have sent them over if the brickwork was bad, and, as a matter of fact, witness did not believe he did send them to look at the St. Pancras job. Holland failed soon afterwards, but witness could not say that Holland attributed that to witness. It was very likely that there were similar complaints about bricks, timber, flooring, &c., against Holland as occurred with Brooks. Witness always refused to pass bricks by inspecting them in the barges, as he had often been imposed upon, the bricks under the hatches being of a different quality from those that were visible on deck. As to the plastering, the witness said that he claimed the right to have it done in the order and in the particular way he required. Coming to the flooring, the witness said that he knew that many of the boards were sappy, but he allowed the Guardians to take them over and pay for them, for they could be utilised for some other purposes. The flooring had to be stacked before being used, but that did not prevent Brooks from bringing on to the job other boards that had been stacked elsewhere. He did not know that they were to be stacked for two years; if Poole had said so, it was not in the specification. Brooks gave credit for about 2 500*l.* for old bricks, but witness would not allow them to be used except in foundations; he did allow bats to be used for certain purposes, although it was prohibited in the specifications. The nine lintels objected to were 4½ in. to 5 in. too high; this would be hidden by the lining, but when the plaster was set it would crack at that point. Witness had heard in Court that two of the lintels were left at the high level, but he had not seen them. Witness was pressed as to his objection to the gutters when Poole did not allow them to be used, because Messrs. Macfarlane had by mistake made the sockets inside instead of outside. Witness was asked what difference this would make? He replied that it was not according to the drawings, and the makers admitted it was wrong; after this he should be inclined to think that nothing did matter at all in building matters. The only difference would have been in appearance. Witness did write to the Guardians that the delay in the laundry and other buildings was due to the delay of Messrs. Benham. There were many complaints in Poole's diary as to delay by Messrs. Benham, and Fearon also complained. There was a penalty clause, but witness did not know that any penalty had been claimed. The salt glazed bricks were generally poor, and many were too dark. The ironwork was generally bad, and the timber was one of the weak points.

Re-examined by Mr. English Harrison:—

So far as witness was concerned he had nothing to do with the failure of Holland. He failed in the middle of a contract. The Guardians purchased everything left by Kirk & Randall, except a few broken drain-pipes, and witness put the cautionary clause, as to sappy timbers and facing bricks, to warn any future contractor, knowing, as he did, of the condition of these materials.

Mr. Alfred Arthur Millward examined, said that he was Clerk to the St. Pancras Guardians. He remembered Fearon calling upon him on May 31, 1892, just as the contract was signed. It was not true that he told Fearon that he could not begin the work as nothing was ready, and that nothing had been arranged as to shifting the inmates. As a matter of fact, the Guardians had made arrangements for boarding out the inmates, and arrangements had been made by which the Master of the Workhouse could make vacant the main block in front, or the main portion of it, within twelve hours' notice, so as to allow the builders to proceed. That was now the "B" Block. Witness told Fearon to see the Master of the Workhouse (Captain Miller), and Messrs. Harstons who would make the necessary arrangements. He frequently saw Mr. Fearon on the works and was always accessible if required. Until the case was launched, and during the whole of the operations, he never heard a suggestion, either from Brooks or Fearon, that the architects or clerk of the works were acting unfairly or dishonestly.

Mr. Bray: Unfairly. I never used the word dishonestly.

Mr. Moyses remarked that the whole of his learned friend's cross-examination was directed with a view to show that Mr. Harston had been unfair to such an extent as to amount to dishonesty.

The learned Referee: I think we had better not discuss this subject now. I say there has been no charge against Mr. Harston of dishonesty in this case from beginning to end.

Mr. MacIntyre: It is made in the statement of claim.

The learned Referee: If it is used there it is certainly not used in the sense of fraud or collusion.

Mr. Moyses remarked that in the statement of claim fraud was mentioned no less than seventeen times.

Cross-examined by Mr. Bray.

It was not his business to interfere with the builders. Brooks was not delayed on "K" Block owing to the engineers' work in the laundry—at least the Guardians were assured that they were not.

Captain Thomas Miller, the Master of St. Pancras Workhouse, examined by Mr. Moyses, said that he recollected seeing Fearon on the day the contract was signed. Fearon said that he wished to commence operations as soon as possible, and witness told him that he should be ready in two days, and that he would clear the part of the building Fearon wanted to go on with within that time. Arrangements had been made to put the inmates out to other unions. Witness did not say that nothing was ready or arranged. Nor did he hear Mr. Millward say so. It was not true that Fearon was constantly asking him for possession of the old Insane Block. He did not recollect referring Fearon to the architects on any of those matters.

Cross-examined: He had had very few conversations with Fearon, as he had nothing whatever to do with the builders or the building operations.

Mr. Frederick Purchase, a member of the Board of Guardians, and a member of the Building Committee gave evidence as to never hearing any complaints either at the Board or Committee Meetings that Mr. Harston was acting either unfairly or dishonestly. The witness said that there was no suggestion, to his knowledge, that the contract was being departed from. The Guardians always adhered strictly to the contract.

Cross-examined: It was the duty of the architects representing the Board to watch over the interests of the ratepayers, and to see that the work was carried out according to specification.

Mr. Charles Challen, a member of the Board of Guardians and of the Building Committee, corroborated the evidence of the last witness.

Cross-examined: He may have heard Fearon say that the clerk of the works was obstructing him, but he knew that it was untrue. He left everything to the architects, who were the arbitrators under the contract.

Mr. Boden, a retired builder, the Chairman of the Building Committee, gave evidence as to speaking to Fearon on several occasions. Fearon made the usual contractor's complaints as to the architects and clerk of the works. Witness's reply would be that if a complaint in writing were sent to the Clerk of the Board the matter would be inquired into by the Committee. He did not remember any official complaint being brought before the Board. There was never any complaint which imputed unjust or dishonest dealing on the part of the architects or Poole.

Cross-examined: He knew that Poole was a difficult man to get on with. He believed that Poole thoroughly understood his business and would take a specification and have it carried out to the letter. He might have told Fearon that Mr. Harston would have every line of the specification carried out as it ought to be. Mr. Tilley (Thomas Tilley & Sons, well engineers), who did some work at the workhouse in 1893, denied that his men interfered with or prevented Brooks's men going on with their work.

Mr. Thos. Wm. Youan, foreman to Messrs. Benham, who did the engineering work to the laundry, was called, and said that he had no complaint to find with Poole or Mr. Harston. Mr. Harston required the specification carried out, but if work was properly executed there was never any trouble.

Mr. A. H. Woolley, secretary to Nash & Co., brickmakers, of Slough, gave evidence as to malm paviors being in October, 1892, 5*s.* dearer than pick stock facings on the field.

Joseph Livock, who superintended the fixing of lifts at the workhouse, said that whenever his men interfered with any joinery work at the building his firm's carpenters made it good.

Mr. Stephen Dobson, a works manager of the St. Pancras Ironwork Company, who did some ironwork at the workhouse, denied that there was any delay on his company's part in fitting-up, nor was there any interference with any part of the work carried on by Mr. Brooks.

Mr. G. R. Crickmay, architect, of Victoria-street, Westminster, the arbitrator to the Local Government Board, gave evidence as to accompanying Mr. Harston to the workhouse on January 13th last, to examine the work which had been done by Brooks, having with him extracts from the specifications and some of the drawings. The witness said that the bright picked stock bricks were irregular in shape and chipped very much. The labour was fairly good, but the material unsatisfactory. The red brick facings in C Block were very much knocked about, and the bricks in A Block were knocked about, and had fire cracks in a number of them. The blue bricks were very sandy on the side, and the salt-glazed bricks varied very much in colour. The York stone step in the entrance-hall was very much laminated, and should not have been put there. The flooring-boards he found to be of a very inferior quality, and the sash-frames were not sunk in accordance with the drawings. The joinery work had shrunk very much, which showed that the wood was unseasoned. From what he saw of the work and material there, he thought the architects had been fairly lenient with the builder.

Cross-examined: He considered the specification an ordinary one. Witness was very careful in drawing out a specification. All brickmakers made bad bricks as well as good.

The learned Referee, during the course of Mr. Crickmay's evidence, asked the learned counsel engaged whether the case could be finished by Saturday, and remarked that if it could not it would have to stand over till May.

Mr. English Harrison and Mr. MacIntyre intimated that in all probability the case could be finished by Saturday. Mr. MacIntyre remarked that in certain circumstances he should have to call, on behalf of the architects, three witnesses—Mr. Currey, Mr. Davis, and a Mr. McCormick.

The learned Referee said that, subject to what might be said to the contrary by Mr. Bray, he did not see how the architects could be made defendants to the action.

It was arranged that the learned Referee should visit the workhouse before the case terminated to view the work which had been done, he being accompanied by two persons to be nominated by each side to point out what had been done.

Mr. Crickmay, cross-examined by Mr. Hudson, said that although he could not point to any workhouse which was better built than the one in question, he had seen buildings of a similar character which were better built.

At the conclusion of the evidence called on behalf of the Guardians, the learned Referee, on the submission of Mr. MacIntyre, decided that the plaintiffs had made out no case against Messrs. Harston, the architects, there being no evidence that they had been guilty of fraud, dishonesty, or collusion. The learned Referee accordingly entered judgment for Messrs. Harston, but reserved the question of costs.

The case against the Guardians was proceeding when we went to press.

MEETINGS.

FRIDAY, MARCH 5.

The Architectural Association.—Dr. F. S. Granger on "Greek Sculpture and Greek Legend," with lantern illustrations. 7.30 p.m.

SATURDAY, MARCH 6.

The Architectural Association.—Spring Visit to Her Majesty's Theatre, Haymarket. 2.30 p.m.

Sanitary Inspectors' Association. — Annual Dinner, Holborn Restaurant. 6 p.m,

Sanitary Institute (Demonstrations for Sanitary Officers). — Inspection at the Marylebone Stoneyard, Richmond-street, Edgware-road, W. 3 p.m.

Institution of Junior Engineers. — Conversazione at the Westminster Palace Hotel. Reception at 7.30 p.m. by the President, Mr. A. R. Binnie, M.Inst.C.E., and Mrs. Binnie.

MONDAY, MARCH 8.

Surveyors' Institution.—The Right Hon. Horace C Plunkett, M.P., on "Agricultural Co-operation." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor A. Bostock Hill on "Factories, Workshops, and Offensive Trades." 8 p.m.

TUESDAY, MARCH 9.

Institution of Civil Engineers.—Further Discussion on (1) "The Main Drainage of London," by Messrs. J. E. Worth and W. Santo Crimp; (2) "The Purification of the Thames," by Mr. W. J. Dibdin; and (3) paper to be read, time permitting, "The Mond Gas-Producer Plant and its Application," by Mr. H. A. Humphrey. 8 p.m.

Carlisle Architectural, Engineering, and Surveying Society.—Mr. W. Pogson on "Stresses in Ironwork."

WEDNESDAY, MARCH 10.

Carpenters' Hall, London Wall.—Paper by Professor Banister Fletcher, entitled "Is a National Twentieth Century Style of Architecture Probable?" Illustrated. 8 p.m.

Society of Arts.—Mr. Frederick Bathurst on "The Prevention of Fires Due to the Leakage of Electricity." 8 p.m.

Sanitary Institute.—Mr. Baldwin Latham on "Indian Sanitation." 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection of Disinfecting Apparatus and Model Steam Laundry at St. John's Wharf, Fulham. 3.30 p.m.

Architects' Benevolent Society. — Annual General Meeting of Donors and Subscribers. 5 p.m.

St. Paul's Ecclesiological Society.—Mr. J. N. Comper, on "The Reasonableness of the Ornaments Rubrick, illustrated by a comparison of the German and English Altars." 7.30 p.m.

THURSDAY, MARCH 11.

Royal Institution.—Professor Percy Gardner, F.S.A., on "Greek History and Extant Monuments." II. 3 p.m.

Society of Antiquaries. — (1) Professor Windle on "Neolithic Implements found in Worcestershire;" (2) Mr. A. Bullerd on "Discoveries at the Glastonbury Lake Village." 8.30 p.m.

CONTRACTS AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered
Bridge Work and Approaches, New Bridge-street	Nuneaton, &c. U.D.C.	J. S. Pickering, C.E. Council Offices, Nuneaton	Mar. 9
*Construction of Sewerage Works	Stoke R.D.C.	L. Sugden, Surv. Miles Bank-chmbrs, Hanley	do.
Three Cottages, Longtown, near Carlisle	.....	J. Wilson, 17, Esk-street, Longtown	do.
Walling and Repairs at Cemetery, near Guildford	Shalford Parish Coun.	Peak & Lunn, Archt. 36, High-street, Guildford	do.
Rebuilding East Side of Arcade, Ilfracombe	.....	L. C. Bridgman, 3, Oxford-grove, Ilfracombe	do.
Additions, &c. Church, Kirtle, Kirtlebridge, N.B.	.....	Hardy & Wight, Archt. 74, George-street, Edinburgh	do.
Two Houses, Swallow-lane, Golcar	Webster & Bickerton	A. Shaw, Archt. Golcar	do.
Shop, Boothferry-road, Goole		H. B. Thorp, Archt Goole	Mar. 10
Council Offices, Cymmer, R.S.O. Wales	Glyncorrwg U.D.C.	Lambert & Rees, Archt. Bridgend	do.
*Boring and Sinking Well	Coalville U.D.C.	J. B. Everard, 6, Millstone-lane, Leicester	do.
Pair Semi-detached Cottages, Prospect-hill, Whitby	Capt. T. Forth	E. H. Smales, Archt. 5, Flowergate, Whitby	Mar. 11
Workhouse Buildings	Kinsale (Ireland) Union	R. Evans, C.E. 53, South Mall, Cork	do.
Cottages, Carriglea and Whitechurch, Ireland	Dungarven Union	J. R. Dower, Poor Law Office, Dungarven	do.
Church Tower, St. Martin's, Potternewton, Leeds	.....	J. Kelly, Archt. Imperial-buildings, Leeds	do.
Street Works	Cromer U.D.C.	A. F. Scott, Surv. Church-street	do.
Timber Groyne, &c. Esplanade	Criccieth (Wales) U.D.C.	T. Roberts & Son, Archt. Portmadoc	Mar. 12
Reservoir, &c.	Harwich Corp.	H. Ditcham, Boro' Surv. Town Hall	do.
Seven Houses, Gasfield, Tirfield, New Tredegar, Mon.	.....	G. Kenshole, Archt. 26, Duffryn-terr. New Tredegar	do.
Villa, Victoria-road, Elland	.....	E. C. Brooke, Archt. The Cross, Elland	do.
Two Houses, Siddal, Yorks	.....	Jackson & Fox, Archt. 23, George-street, Halifax	Mar. 13
Additions, &c. Junction Hotel, Dorchester	.....	A. L. T. Tilley, Archt. 16, Cornhill, Dorchester	do.
*Two Entrance Lodges and Twelve Cottages	Lancs. Asylums Board	F. C. Hulton, County Offices, Preston	do.
Club Premises, Fleet-street, New Swindon	North Wilts Conservative, &c. Club	W. Drew, Archt. 22, Victoria-street, Swindon	do.
Pair Villas, Down Dinner-hill, Whitby	Capt. Nicholson and Capt. Ramsdale	J. J. Milligan, Archt. 77, Baxtergate, Whitby	do.
Police Station, Galgate, near Lancaster	Standing Joint Com.	H. Littler, Archt. 21, Pitt-street, Preston	do.
*Removal of House Refuse	Twickenham U.D.C.	W. Ruston, Town Hall	do.
Additions, &c. Pen-y-lan Inn, Aberaman, Aberdare	T. Jones	T. Roderick, Archt. Aberdare	do.
Schools	Carnarvon Sch. Bd.	R. L. Jones, Archt. 14, Market-place, Carnarvon	do.
Surveyor's Materials	Padiham (Lancs) U.D.C.	J. Gregson, C.E. Council Offices	do.
*Asphalte Paving	St. Giles (Holborn) Bd. of Works	G. Wallace, 197, High Holborn, W.C.	Mar. 15
*Works and Materials	do.	do.	do.
Road Works	Alnwick R.D.C.	G. Short, Surv. Alnwick	do.
*Coal and Cleansing, &c. Roadways, &c.	Bridge House Estates Committee	Comptroller, Guildhall	do.
*Cast-iron Ventilating Shaft	Hornsey U.D.C.	E. J. Lovegrove, 99, Southwood-lane, Highgate, N.	do.
Schools, Catayke, Yorks	Glass Houghton Sch. Board	G. F. Pennington, Archt. Bridge-street, Castleford	do.
Schools, Offices, Fox-hill	Queensberry (Yorks) School Board	J. Drake & Son, Archt. Winterbank, Queensbury	do.
Twelve Houses, Clay-street, Beech, Sowerby Bridge, Yorks	.....	S. Wilkinson, Archt. Sowerby Bridge	do.
*Wood Block Flooring	Camberwell Vestry	Vestry Hall	do.
School, Ebbw Vale, Mon.	Aberystwith Sch. Bd.	G. Rosser, Archt. Victoria Buildings, Abercorn	do.
*Repaving, Kerbing, and Channelling	Chichester Corp.	City Surveyor	Mar. 16
*Smith's Work	Commrs. of Sewers	Guildhall, E.C.	do.
*Road Materials	Bromley U.D.C.	Council Offices	do.
Club, Fountain-street, Morley, Yorks	Working Men's Club Trustees	S. B. Birds, Archt. 47, High-street, Morley	do.
*Nurses Home, Caterham	Met. Asylums Board	E. T. Hall, 57, Moorgate-street, E.C.	Mar. 17
*Isolation Pavilion, Winchmore Hill	do.	Offices, Norfolk House, Norfolk-street, W.C.	do.
Steel Girder Bridge, Content House	Ayr Commissioners	J. Eaglesham, C.E. Town-chambers, Ayr	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Limestone and Granite (3,000 tons)	Burnley R.D.C.	S. Edmondson, Surv. 18, Nicholas-st. Burnley	Mar. 17
*Sewage Farm Works	Burton-on-Trent Corp.	J. E. Swindlehurst, Boro' Engineer	do.
Sewage Pipes	do.	do.	do.
Drain Tiles, Ftwall	do.	do.	do.
Main Conduit (four miles)	Belfast Water Com.	Mr. Macassey, C.E. Waterworks Office	Mar. 18
Stone (5,000 tons)	Abingdon R.D.C.	T. B. Warren, Surv. 59, Stert-street	Mar. 19
*Making-up Carriageway, Footpaths, &c.	Surbiton U.D.C.	S. Mather, Victoria-road, Surbiton	Mar. 20
Labourers' Cottages	Omagh Union	W. Cathcart, Workhouse, Omagh	do.
Church, Cashlard, Ireland	Rev. B. Kelly	E. J. Toye, Archt. Strand, Derry	do.
Three Cottages, Gigha, Argyllshire	.....	Hugh Douglas, Gigha	do.
*Annual Contracts	Lewisham B. of Works	B. of W. Office, Catford, S.E.	Mar. 23
School, George-street, Buckland	Portsmouth Sch. Bd.	G. C. V. Inkpen, Surv. 75, King's-road, Southsea	do.
*Sewers	Lewisham Bd. of Wks.	Board of Works Office, Catford, S.E.	do.
*Fire Engine House, Cottage, Stable, &c.	Barnet U.D.C.	The Surveyor, 40, High-street, Barnet	Mar. 24
Police Station and Library, Upper Wortley	Leeds Corporation	City Engineer, Municipal-buildings	do.
*Sewerage Works	Sandgate U.D.C.	A. R. Bowles, Sandgate	Mar. 25
Sewer, Cross-street	Barnstaple T.C.	J. Bosson, Municipal-buildings	do.
*Hot Water Supply	Lincoln County Hospital Governors	W. Watkins, St. Edmonds Chambers, Silver-street, Lincoln	Mar. 26
*Drapery Establishment	J. Walsh	Flockton, Gibbs, & Flockton, 15, St. James's-row, Sheffield	Mar. 27
Pipe Sewers, Barnwood, &c.	Gloucester R.D.C.	J. F. Trew, C.E. County-chambers	do.
*County School	Newton Sch. Governors	H. Teather, Andrews-bldgs, Queen-street, Cardiff	Mar. 31
*Railway, Reservoir, Filter Beds, &c.	Birmingham Corp.	J. Mansergh, 5, Victoria-street, S.W.	do.
House, Stanground, Peterboro'	T. Freear	J. G. Stattebrass, Archt. North-street, Peterboro'	No date
Brewery, Stourbridge	North Worcestershire Breweries, Ltd.	C. Johnson & Sons, Archt. Worcester	do.
Hospital, Sicklinghall, nr. Wetherby	Wetherby R.D.C.	T. E. Marshall, Archt. Princess-st. Harrogate	do.
Excavating, Underpinning, &c. Leeds	London and Midland Bank	Wm. Bakewell, Archt. 38, Park-square, Leeds	do.
House, Shaw-street, Rochdale	T. Firth	N. Mills, Archt. 67, Lord-street, Rochdale	do.
Oak Screen, &c. Parish Church, Rotherham	.....	J. E. Knight, Archt. 20, Moorgate-st. Rotherham	do.
Schools, Ogden Baptist Chapel, Rochdale	.....	Butterworth & Duncan, Archt. 4, South-parade, Rochdale	do.
Farmhouse, Coltclose, near Ivegill, Penrith	.....	G. Watson & Sons, Archt. 3, St. Andrew's-pl. Penrith	do.
Residence, Nab-lane, Shipley, Yorks	.....	Arch. Neil, Archt. 16, Cookridge-street, Leeds	do.
Schools, Hope Congregational Church, Wigan	.....	W. E. V. Crompton, Archt. Moot Hall Chmbs. Wigan	do.
Chapel, School, and Hall, Eccles, Lancs.	.....	T. D. Lindley, Archt. 159A, Stamford-street, Ashton-under-Lyne	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of Works	St. Helen's Corp.	2l. 10s. per week	Mar. 13
*Clerk of Works	North Wales County Lunatic Asylum	3l. per week	Mar. 15
*Surveyor and Inspector of Nuisances	Farnboro' U.D.C.	200l. inclusive	do.
*Temporary Assistant	Spennymoor U.D.C.	.....	do.
*Secretary	R.I.B.A.	400l. per annum	Mar. 20

Those marked with an asterisk (*) are advertised in this Number. *Contracts, pp.* lv. vi. & viii. *Public Appointments, pp.* xviii. & xxi.

Institution of Electrical Engineers.—Mr. H. Benest on "Some Repairs to the South American Company's Cable off Cape Verde 1893 and 1895." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Osborne Smith on "Construction and Arrangements of School Buildings." 8 p.m.

FRIDAY, MARCH 12.

Royal Institution.—Professor A. Smithells on "The Source of Light in Flames." 9 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—Paper to be read and discussed: "The Protection of Buildings, &c., from Fire," by Mr. W. R. Beckton. 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. H. F. Brand on "The Inverness Section of the Inverness and Aviemore Railway." 8 p.m.

SATURDAY, MARCH 13.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Aylesbury Dairy Company's Premises, Bayswater. 3 p.m.

Edinburgh Architectural Association.—Visit to Hatton House, West Calder.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

2,784.—CIRCULAR SAWS: *J. Benton.*—The invention consists in the application, in a circular saw bench, of two small horizontal saws to operate upon and take the wood, in whatever breadth may be required, by means of a mechanical attachment to small discs with collars, which slide up and down, as required, on spindles; and also the application of a feed roller, by means of which the wood is fed continuously, and held tight to fence in combination with endless chains and mitre cogs to drive the spindles and automatic feed.

5,549.—TRAP FOR DRAINS AND SEWERS: *E. Codling.*—This invention consists in an intercepting or disconnecting trap for drains, &c., provided with an access arm on the outlet side of the trap, and an adjustable piece for altering the direction on the inlet side of trap.

18,714.—ARTIFICIAL STONE: *A. J. Boult.*—This invention has for its object the manufacture of artificial stone for paving purposes, &c. To effect this, very intense pressure is exerted on materials, which are in the main found by the top layer, binding medium, and ground mass. Top layer consists of asphalte powder, brought to a glowing temperature before being introduced into the stone mould. Binding medium consists of Portland cement, pulverised unslaked lime, and ground strass. Ground material consists of a stone of rocky hardness of porous nature, as porous basalt lava, found in the neighbourhood of the Laucher Lake and elsewhere, which is used in three degrees of size of particles. These materials, slightly wetted, being introduced into the mould and while the top material is put in very hot, all are subjected to a pressure of about 300 atmospheres.

24,081.—FLUSHING APPARATUS FOR TROUGH CLOSETS, LATRINES, &c.: *H. Clay.*—To flush basins and troughs and latrine pipes, inventor employs a tank provided with a stand-pipe and bell—forming the main syphon—and an auxiliary syphon to give an after flow, which tank contains flushing water. Above the tank is a smaller one fed with water in usual manner. This discharges periodically into the large tank by means of a syphon, whereby when the larger tank is full the next discharge from the smaller tank sets up the main syphonic action of the larger one. The said stand-pipe dips into a well below the larger tank and into this are led the flush-pipes. This form of tank is particularly applicable where a periodical flushing is required.

3,364.—CISTERN SYPHONS: *W. A. McCormick.*—Invention consists in a chamber connected with the discharge pipes, having a plunger, bellows, &c. adjustable so that by a movement a vacuum is caused, into which the air from the discharge pipe is drawn, the liquid in the cistern following it, thus causing the discharge. A flap, or valve, &c. prevents air being drawn in through outlet, and the gurgling is prevented by a trumpet mouth to end of syphon.

4,894.—APPARATUS FOR STARTING FLUSHING TANK SYPHONS: *J. Jobbins.*—In this invention as applied to water-closets, the syphon in the flushing tank is put into action through the medium of a piston which fits a cylindrical chamber provided in the flushing pipe and conveniently situated in the wall of the closet. From the piston a piston-rod, carried through a stuffing-box is extended through the wall into the closet. Other arrangements are also specified.

NEW APPLICATIONS FOR LETTERS PATENT.

FEBRUARY 15.—4,003, A. Doman, Brackets for supporting Rain-water Gutters and Spouting.—4,036, W. Griffiths, Automatically Fixing Windows at any desired height.—4,042, F. Dittmar, Draught-Indicator for Chimneys and Flues.—4,048, W. Robinson and S. Brookfield, Cement and Concrete.—4,067, F. Harrison, Cutter Heads for Wood-working Machinery.—4,075, C. Tully, Chimney Draught Shield.—4,076, C. Oliphant and A. Cunnew, Stoves or Grates.

FEBRUARY 16.—4,141, T. Horn, Window Glass.—4,146, H. Fitzpatrick, Sash Locks or Fasteners.—4,159, R. Brown, Automatically-Locking Sash Holders.—4,192, G. McKenzie, Floors.—4,199, H. Barnett, Casement Windows.—4,205, W. Bailey, Water Heating Apparatus for Kitchen Grates, &c.

FEBRUARY 17.—4,264, T. Robb, Machinery for Sawing or Cutting Wood, &c.—4,290, J. Jeffreys, Ventilating Fans.—4,295, A. Muirhead, Firegrates.

FEBRUARY 18.—4,378, W. Cockburn, Securing Door Knobs to their Spindles.—4,383, A. Bucknall, Constructing Portable and other Wooden Buildings, also applicable to floors and other parts of buildings,—4,399, G. Pitt, Brick Kilns.—4,459, R. Dillon, Saw Sets.

FEBRUARY 19.—4,571, L. Wells, Ladders.

FEBRUARY 20.—4,589.—E. Settle, Draught and Dust Excluder for Doors.—4,606, S. Adams, Flushing Chambers, &c.—4,638, G. Beck, Attaching Door Knobs to Spindles.—4,647, W. Brothers, Firegrates.—4,652, J. Cox, Laying of Drainpipes.—4,658, J. Hussey, Plumbers' Pots, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

14,401, A. Cripps, Lever-bolting Lock.—940, D. Taylor, Door Hanks, &c.—1,883, A. Churley and Greenway, Clive, Vale, & Co., Limited, Lock Furniture.—2,052, A. Thompson, Window-sash Fasteners.—2,425, W. Vickery, Mitre Cramp.—2,426, R. Grimmer, Fastening for Doors, Windows, &c.—2,517, F. Bool, Facilitating the Correct Laying of Sewer and Drain Pipes.—2,840, H. D. Keith, Windows and Doors.—2,869, W. Holt, Screens for the Use of Builders, Contractors, and others.—2,878, A. Hall, Construction of Hospitals; also applicable to other buildings.—2,986, J. Major, Firegrates.—3,210, H. Webb, Windows, and their Sashes and Casements.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to opposition for two months.

4,105, D. Doyle and T. Ferrell, Pug-mills for making Bricks, Tiles, &c.—5,310, J. Hulse, Lavatory and Water-closet Apparatus.—8,531, H. Swain, Chimney-pot or Ventilator.—10,037, J. Richards, Gully Traps.—26,331, W. Neighbour, Drain Plug and Hopper for Testing Drains in Sections.—29,916, G. St. John, Firegrates.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 28.—By BOYTON & PEGRAM (at Walham Green).

Fulham.—1 to 4, Aintree-ter., u.t. 97½ yrs., g.r. 18*l.*, r. 126*l.* 18s. £915
42, Hartismere-rd., u.t. 88¼ yrs., g.r. 5*l.* 5s., r. 30*l.* 310

By DOBSON & SON (at Bradford).

Bradford, Yorks.—Little Horton-lane, "Armstrong's Hotel," with house and shop adjoining, f. 9,500

By CALTHROP & BRIGGS (at Brigg).

Scotter, Lincolnshire.—"Scotter Wood Farm," 387 a. 2 r., f.... 8,100

January 29.—By CRASKE & SONS.

Bermondsey.—3 to 15 (odd), Alscot-rd., u.t. 24 yrs., g.r. 20*l.* 1,135
22, Alfred-st., r. 31*l.* 4s.; also l.g.r. 10*l.*, u.t. 26 yrs., g.r. 10*l.* 10s. 200
70, The Grange, u.t. 19¼ yrs., g.r. 5*l.* 235
87, 89, and 91, Stanworth-st., u.t. 19¼ yrs., g.r. 5*l.* 270
74 and 80, Stanworth-st., u.t. 17 and 18 yrs., g.r. 5*l.* 1s. 220

By HARMAN BROS.

Islington.—43, Linton-st., u.t. 30½ yrs., g.r. 4*l.* 4s., r. 35*l.* 545
Clapton.—57, 59, and 61, Nightingale-rd., f., r. 108*l.* 1,555

February 1.—By NOKES & NOKES.

Ilford.—Granville-road, "Elm Villa," f., r. 36*l.* ... 530

By THOMAS & BETTRIDGE (at Birmingham).

Birmingham, Warwick.—Green-lane, a freehold building estate, containing 38 a. 1 r. 20 p. 15,600
Hobmoor-lane, "Brook Meadow," 5 a. 3r., f. ... 280

February 2.—By DRIVER & CO.

Regent-st.—The Site of Hanover Chapel, area 6,666 ft.; the letting on building lease for 80 yrs., at per annum 2,120

By DEBENHAM, TEWSON, & CO.

Epsom, Surrey.—Ashley-rd., "The Retreat"; also "Inglewood House" and "Rutland House," in South-st., area 1 a. 1 r. 24 p., f. 1,650
The Parade, Chandler's Cottages, f., r. 41*l.* 8s. 500

By E. H. HENRY.

Clapham.—6, 10, 12, and 14, North-rd., u.t. 43½ yrs., g.r. 32*l.*, r. 205*l.* 1,800
37, Park-hill, f., e.r. 65*l.* 710
Hammersmith.—50, Hammersmith-rd., f., r. 90*l.*... 2,140
Clapham.—59, Fentiman-rd., u.t. 31½ yrs., g.r. 7*l.* 10s., r. 42*l.* 275

By MATTHEW MILES (at Mason's Hall Tavern).

Surbiton, Surrey.—Victoria-rd., "The Victoria" tavern, f., r. 140*l.* 10,310

By BRADY & SON (at Manchester).

Peak Dale, Derbyshire.—"The Midland" Hotel, f. 4,000

February 3.—By DONALDSON & SON.

Dalston.—116, 118, and 120, Brougham-rd., u.t. 48 yrs., g.r. 30*l.*, r. 99*l.* 345

By SEGRAVE, BROWETT, & CO.

Beckenham.—47, Cedars-rd., u.t. 79 yrs., g.r. 7*l.*, e.r. 45*l.* 360

By E. P. NEWMAN (at Southall).

Greenford, Middlesex.—Two enclosures of land, 15 a. 1 r. 24 p., with building thereon, f., r. 45*l.* 1,350

By F. W. KIDD (at Newark).

Dry Doddington, Lincs.—A freehold farm, comprising 89 a. 2,005

By J. B. JONES & SONS (at Preston).

Goosnargh, Lancashire.—"White Gate House Farm," 6 a. 0 r. 36 p., f 424
Cadley, Lancashire.—"Ivy Cottage" and farm, 9a. 0r. 15p., f. 1,800

By KING & CHASEMORE (at Horsham).

Horsham, Sussex.—"The Horsham Ironworks," area half an acre, f., with goodwill, plant, and machinery 2,500

February 4.—By S. WALKER & SON.

Lambeth.—32 to 42 (even), Lambeth-rd., f., r. 266*l.* 3,725
Holloway.—Tufnell Pk-rd., i.g.r. 10*l.* 10s., u.t. 72 yrs., g.r. 2*l.* 200
Foxham-rd. i.g.r. 34*l.*, u.t. 77½ yrs., g.r. 2*l.*, ... 750

By EASTMAN BROS.

Brixton.—33, Lambert-rd., u.t. 77 yrs., g.r. 6*l.* 12s. 430

By REYNOLDS & EASON.

Strand.—Portugal-st., freehold building site, area 1,600 ft., with the "George the Fourth" p.h. thereon 7,550
King's Cross.—11, Argyle-st., u.t. 43½ yrs., g.r. 13*l.* 15s., r. 45*l.* 450

By ROGERS, CHAPMAN, & THOMAS.

Pimlico.—68, 70, and 72, Winchester-st., u.t. 31 yrs., g.r. 28*l.* 1,040
29 and 31, Lupus-st., u.t. 36½ yrs., g.r. 22*l.*, r. 14*l.* 10s. 1,215
90 and 92, St. George's-rd., u.t. 36½ yrs., g.r. 24*l.*, r. 200*l.* 1,650
81, Denbigh-st., u.t. 36½ yrs., g.r. 10*l.*, r. 55*l.* ... 465
85 and 87, Charlwood-st., u.t. 35 yrs., g.r. 17*l.*, r. 105*l.* 1,095

By H. DUKE & SON (at Wareham).

East Stoke, Dorset.—"The East Stoke Manorial Estate," comprising 1,500 a., f. (including timber) 12,400

February 5.—By ROBERT REID.

Chelsea.—King's-rd., "The Globe" p.h., f.g.r. 20*l.*, reversion in 15 yrs. 6,450

By BRIANT & SON.

Tooting.—5 and 6, Aldis-ter., u.t. 71½ yrs., g.r. 20*l.*, r. 64*l.* 685
Southwark.—40 and 42, Swan-st., u.t. 20 yrs., g.r. 7*l.* 10s., r. 57*l.* 325

By MARTIN, CLARKE, & CO.

Holloway.—81 and 83, Tollington-pk., u.t. 68½ yrs., g.r. 20*l.*, r. 100*l.* 888

By J. H. BETHELL.

February 8.—
Limehouse.—102, Salmon's-lane, f., r. 35*l.* 610
19, 21, and 23, Endive-st., u.t. 12 yrs., g.r. 9*l.*, r. 75*l.* 12s. 200
Poplar.—Duff-st., &c., f.g.r. 10*l.*, reversion in 89½ yrs. 225

February 9.—By C. H. BROWN.

Wandsworth.—58, Honeywell-rd., u.t. 90½ yrs., g.r. 6*l.* 6s., e.r. 35*l.* 300

By WESTON & SONS.

Kennington.—1, 2, 4 to 18 (even), Warham-st., f., r. 236*l.* 12s. 3,575
86 to 96 (even), St. Mark's-rd., f., r. 156*l.* 2,020
9, 11, and 13, Stannary-st., f., r. 78*l.* 1,210
South Lambeth.—2, Devonshire-rd., f., r. 45*l.*..... 690
Brixton.—71, Angell-rd., u.t. 65¼ yrs., g.r. 7*l.* 10s., r. 48*l.* 435
27, Barrington-rd., u.t. 26 yrs., g.r. 7*l.*, r. 50*l.* ... 390
Stockwell.—10, Bellefields-rd., u.t. 67½ yrs., g.r. 19s., r. 38*l.* 480
115, Dalyell-rd., u.t. 74½ yrs., g.r. 6*l.*, r. 30*l.*..... 335
Brixton.—34 and 35, Grove-rd., u.t. 26 yrs., g.r. 12*l.*, r. 100*l.* 730
9, 19, 21, and 23, Stockwell-pk.-cres., g.r. 28*l.* 12s., r. 168*l.* 1,045
Stockwell.—10, 12, and 14, Burgoyne-rd., u.t. 58¾ yrs., g.r. 14*l.* 15s. 755
Clapham.—40 to 58 (even), Wirtemberg-st., u.t. 56¾ yrs., g.r. 45*l.* 2,070
11, 13, 15, and 17, Trigon-rd., u.t. 27½ yrs., g.r. 18*l.*, r. 122*l.* 1,155
Walworth.—30, Carter-st., u.t. 84½ yrs., g.r. 6*l.* 10s., r. 30*l.* 350
124, 128, and 130, Lorrimore-rd., u.t. 53 yrs., g.r. 13*l.* 10s., r. 96*l.* 1,065

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard &c.

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.	ton	£8/0/0 — 9/0/0
Teak, E.I.	load	11/0/0 — 16/0/0
Sequoia, U.S it.cu.		1/9 — 2/0
Ash, Canada	load	2/15/0 — 4/0/0
Birch, do.		3/15/0 — 5/10/0
Elm, do.		3/10/0 — 4/15/0
Fir, Dantsic, &c..		2/15/0 — 4/15/0
Oak, do.		2/15/0 — 3/15/0
Canada		5/0/0 — 6/0/0
Pine, Canada red		0/0/0 — 0/0/0
Do. Yellow		2/5/0 — 4/5/0
Lath, Dantsic, fath		4/10/0 — 5/10/0
St. Petersburg..		5/0/0 — 6/10/0
Wainscot, Riga, &c., log		2/10/0 — 4/15/0
Odessa, crown		2/10/0 — 4/15/0
Deals, Finland		
2nd & 1st std	100	9/0/0 — 9/10/0
Do. 4th & 3rd		9/0/0 — 9/10/0
Do. Riga		7/10/0 — 8/10/0
St. Petersburg, 1st yellow		11/0/0 — 13/10/0
Do. 2nd yellow		10/0/0 — 11/0/0
Do. white		9/10/0 — 11/10/0
Swedish		9/0/0 — 16/10/0
White Sea		10/10/0 — 17/0/0
Canada, Pine 1st		20/0/0 — 23/0/0
Do. do. 2nd		14/10/0 — 16/10/0
Do. do. 3rd, &c.		7/0/0 — 10/10/0
Do. Spruce, 1st.		9/10/0 — 11/0/0
Do. do. 3rd and 2nd		7/15/0 — 9/0/0
New Brunswick		7/0/0 — 10/10/0
Battens, all kinds		5/0/0 — 20/0/0
Flooring boards, sq., 1 in. prep.		
1st		0/9/0 — 0/16/0
Do. 2nd		0/7/6 — 0/12/6
Other qualities—		0/5/9 — 0/7/0
Cedar, Cuba, ft.		/4½ — /5
Honduras, &c.		/4 — /5
Mahogany, Cuba		/4½ — /6
St. Domingo, cargo av.		/4½ — 1/3
Mexican, do. do.		/4 — /5
Tobasco, do. do.		/5 — /7
Honduras, do.		/5 — /6½
Box, Turkey, ton		4/0/0 — 25/0/0
Rose, Rio		7/0/0 — 14/0/0
Bahia		6/0/0 — 25/0/0
Satin, St. Doming.		0/0/7 — 0/1/0

TIMBER *(continued)*.

Satin, Porto Rico		0/0/7 — 0/1/6
Walnut, Italian		0/0/3 — 0/0/7

METALS.

Iron—Pig, in Scotland	ton	2/5/7 — 0/0/0
Bar, Welsh, in London		5/15/0 — 5/17/6
Do. do. at works in Wales		5/10/0 — 5/12/6
Do. Staffordshire, in London		5/15/0 — 6/10/0
COPPER—British cake and ingot		54/5/0 — 54/15/0
Best selected		55/0/0 — 55/10/0
Sheets, strong		6 /0/0 — 61/0/0
Chili bars		50/16/3 — 0/0/0
YELLOW MTL	lb.	0/0/5 — 0/0/5½
LEAD—Pig, Spanish	ton	11/12/6 — 11/13/9
English com. brands		11/13/9 — 11/16/3
Sheet, English 6 lbs. per sq. ft. and upwards		12/18 9 — 0/0/0
Pipe		13/8 9 — 0/0/0
ZINC—English sheet	ton	20/10/0 — 0/0/0
Vieille Montagne		21/10/0 — 0/0/0
Spelter		17/7/6 — 17/12/0
TIN—Straits		62/16/3 — 0/0/0
Australian		62/5/0 — 62/15/0
English Ingots		65/0/0 — 65/15/0
Banca		61/0/0 — 0/0/0
Billiton		59/15/0 — 60/0/0

OILS.

Linseed	ton	14/15/0 — 0/0/0
Cocoanut, Cochin		27/15/0 — 0/0/0
Do. Ceylon		24/0/0 — 0/0/0
Palm, Lagos		24/10/0 — 0/0/0
Rapeseed, English pale		27/10/0 — 27/15/0
Do. Brown		27/0/0 — 27/10/0
Cottonseed ref.		15/17/6 — 16/10/0
Oleine		18/10/0 — 19/10/0
Lubricating U.S.		0/6/3 — 0/7/6
Do. black		0/4/9 — 0/6/6
TAR—Stockholm	barrel	22/0 — 0/0/0
Archangel		0/12/6 — 0/0/0
Turpentine	ton	21/0/0 — 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender: and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

BARNET.—For the erection of detached residence at New Barnet, for Mr. A. Tillman. Mr. F. Child, architect, 65, Chancery-lane, and New Barnet:—

A. Porter	£2,130	Wells & Son	£1,770
J. Ellwood	2,115	Eddie & Son	1,657
G. Daniels	2,090		

BEDFORD.—For the construction of an underground convenience, Tavistock-street, for the Urban Sanitary Authority:—

B. Litchfield & Son	£392	E. Pacey	£366
F. Corby	371	T. H. Coleman	355
A. Corby	366	G. E. Fathers, Bedford*	346

*Accepted.

BRADFORD.—For the erection of a weaving-shed and warehouse, Bowling. Mr. Fred. Holland, engineer, 11, Parkinson-chambers, Hustlergate, Bradford. Quantities by the engineer:—

Masonry.—Thomas Shackleton, Statt Hall, Clayton Heights, near Bradford	£696 17
Joinery.—J. Patchett, Queensbury, near Bradford	199 0
Ironwork.—J. Cliff & Co., Old Foundry, Bradford	650 0
Plumbing.—M. Slinger & Son, Wakefield-road, Bradford	90 0
Slating.—Hill & Nelson, Bradford	100 0
Painting.—A. Davey, Wakefield-road, Bradford	24 0

[Amended tenders.]

BRIGHTON.—For the erection of the Roedean School (exclusive of engineering works). Mr. John W. Simpson, architect, 10, New Inn, Strand, W.C. Quantities by Messrs. Pinks & Watson, 45, Parliament-street, S.W.:—

F. & H. F. Higgs	£60,850	Holloway Bros.	£53,400
H. Lovatt	57,300	Stimpson & Co.	53,300
W. Johnson & Co.	56,755	Barber & Olliver	50 419
John Shillitoe & Son	56,000	Longley & Co.	49 969
Peerless, Dennis & Co.	54,100	Foster & Dicksee	49 794
W. Botting & Son	53,750	W. Wallis	49,620
G. R. Lockyer	53,560	W. Brown & Son	49,552
John Parnell & Son	53,408 12 2	Sattin & Evershed	46,167
		P. Peters & Son, Horsham*	44,937

* Accepted.

BRIGHTON.—For reconstruction of portion of pier, for the Brighton West Pier Company. Mr. W. H. Bailes, engineer:—

Allsup & Co.	£5,457 1 8	Shaw & Co., and Longley & Co.	£4,458 3 0
W. O. Brettell	4 794 17 7	A. Thorne	3,720 13 9

BRISTOL.—For making Fitzroy-street, and four other roads, Totterdown, for the Long Ashton Rural District Council. Mr. M. Fround, Surveyor, 1, St. Stephen's-chambers, Bristol:—

J. Perkins	£1,939 16	W. Hurford	£1 168 0
Lloyd & Son	1,279 0	M. Durnford	1,161 0
H. Weeks	1,232 0	A. J. Beaven	1,095 0
W. Galbraith	1,220 0	Thomas & Webb	689 0
Hughes & Weeks	1,181 0	W. Hickery, Knowle*	949 0

* Accepted.

CARDIFF.—For paving, sewering, &c., Romilly, Radnor, and Llanfair-roads, for the Corporation. Mr. W. Harpur, C.E., Borough Engineer, Town Hall, Cardiff. Quantities by Borough Engineer:—

Romilly-road.

J. Rich, Cardiff,*	for sewer	£2 5 2 0
" "	for road, &c.	1,145 1 10

Radnor-road.

" "	for road, &c.	193 9 2

Llanfair-road.

" "	for road, &c.	569 2 9

For sewer only in Romilly-road.

F. Ashley		234 4 0

* Accepted.

DEVONPORT.—Accepted for the erection of branch banking premises, for the Union Savings Bank, at Keyham-road. Mr. H. G. Luff, architect, 64, Chapel-street, Devonport:—

Wm. Littleton, Devonport £1,518

FOLKESTONE.—For the erection of public baths, for the Corporation. Mr. Reginald Pop, architect, Radnor-chambers, Folkestone. Quantities by architect:—

Builder's Work.

Moody	£3,187 0 0	Franklin	£2,755 0 0
Tunbridge	3,100 0 0	Webster	2,640 0 0
Petts	2,967 0 0	Grayling	2,624 10 7
Newman	2,858 0 0	Fearon (accepted)	2,504 0 0

Engineer's Work.

Sugg & Co.	£904 0 0	J. & F. May	£625 0 0
Rosser & Russell	782 0 0	Bradford (accepted)	618 10 0

GRIMSBY.—Accepted for the erection of business premises, Cleethorpe-road, Grimsby. Mr. Geo. W. Frost, architect, 174, Heneage-street, Grimsby:—

Wilkinson & Houghton, New Cleethorpe, Grimsby £800

GRIMSBY.—For the erection of a pair of cottages, Sheepfold-street, Grimsby, for Mr. W. Blanchard. Mr. Geo. W. Frost, architect, 174, Heneage-street, Grimsby:—

Ion & Lewis, Lim.	£355 0	H. Emerson	£296 0
J. Pearson	346 16	A. Atkinson (accepted)	287 14

HARTWOOD (Lanark).—For the erection of two blocks of cottages at the Asylum, for the Lanark District Lunacy Board. Mr. J. Lamb Murray, architect, Heavyside, Biggar. Quantities by Messrs. H. Herbertson & Co., 167, St. Vincent-street, Glasgow:—

Masonry.

John Purdie & Co.	£1,952 2 4	McLehose & Son	£1,575 4 5
Wilson & Wallace	1,722 16 11	Robert Riddagh	1,560 5 2
Dunlop & Co.	1,646 7 5	William Allan, Strathaven*	1,461 6 3
William Purdie	1,621 0 5		
J. Turner & Co.	1,612 7 3		

Joinery.

Robert Smellie	£597 0 0	George Ferguson	£931 12 2
James Steele	561 10 0	John Baxter, Strathaven*	832 10 0
William Adam	944 11 5		
Muir & Davidson	942 13 7½		

Slating.

R. & W. Anderson	£231 14 0	James Brown, Shotts*	£184 19 5½
Hamilton & Co.	221 18 7		
James Currie	197 18 11		

Plumbing.

John McEwan	£209 17 7	James Hazel & Sons, High Blantyre*	£170 9 9
John Spence & Sons	200 18 8		
Brown & Young	196 4 12½		

Plastering.

John Forbes	£227 8 4	James Brown	£206 4 11
Hamilton & Co.	228 13 10	R. & W. Anderson, Bellshill*	202 9 5½
James Grant	224 4 7		
James Currie	218 0 2		

* Accepted.

HOUNSLOW.—Accepted for the erection of a detached house, Whitton Park Estate, Hounslow. Mr. T. Merrison Garrood, architect and surveyor, 172, Fenchurch-street, City:—

Lucas & Son £1,982

IPSWICH.—For additions, &c., to offices, Tower-lane, for Mr. W. E. Kersey. Mr. J. S. Corder, architect, Wimbourne House, Ipswich. Quantities by Mr. J. S. Parmenter, Ipswich:—

Avis	£1,422 0 0	Death	£1,028 17 2
Crisp & Smith	1,350 0 0	Marriott	1,026 17 0
Hipwell	1,272 0 0	Pollard	1,015 12 8
T. Kenny	1,194 0 0	Catchpool	924 0 0
G. Kenny	1,143 0 0	Parkington	982 0 0
F. Bennett	1,040 0 0	Sadler*	979 0 0
Girling	1,037 0 0	Coe	953 16 0

[All of Ipswich]

* Accepted on an amended estimate.

KEIGHLEY.—Accepted for the erection of six houses and stores, Fell-lane, for the Industrial Co-operative Society, Limited. Mr. John Haggas, architect, North-street, Keighley:—

Masonry.—Sugden, Mitchell, & Sunderland, Oakworth, near Keighley
Slating.—W. Thornton, Bingley
Plastering.—Wilson Bros., Oakworth-road, Keighley
Plumbing.—Jas. Jackson, Lawkholme-lane, Keighley
} £1,800

LEYTON.—For sheds for water vans and steam road roller, and for sewer works. Mr. W. Dawson, Engineer and Surveyor:—

For Sheds.

W. Lawrence	£553 0 0	F. J. Coxhead, Leytonstone*	£485 0 0
J. Haydon	544 0 0		
H. R. Rous	527 17 9		

* Accepted.

[Surveyor's estimate, £430.]

Sewer in Boundary-road.

T. Adams	£456 0	G. Wilson	£300 10
J. Burrell	448 10	J. Jackson, Leyton*	297 0

* Accepted.

[Surveyor's estimate, £314.]

LONDON.—For rebuilding front, 24, Pyrland-road, Canonbury Messrs. Bradbear, surveyors, Canonbury Station, N.:—

Steel	£139 10	George Barker	£117 [illegible]
Timson	136 0		

LONDON.—Accepted for the erection of shop and flats at No. 55, Frith-street, Soho, for Mr. M. O'Leary. Messrs. Brunsden & Henderson, architects, 47, Pall Mall, S.W. Quantities by Mr. J. Peebles, 88, Chancery-lane, W.C.:—

W. S. Beaton £1,654

LONDON.—For building seven shops, Leytonstone-road. Mr. William Stone, architect, 2, Great Winchester-street, E.C.:—

F. & F. J. Wood	£6,239	Roome	£4,980
Jennings	5,393	Sherwood	4,600
Jarvis & Son	5,273	Steed	3,[illegible]
Higgs	5,160		

LONDON.—For erecting a wheelwright's shop and smithy, Times Wharf, Hoxton, for Messrs. Rickett Smith & Co., Limited. Messrs. Potts, Son, & Hennings, architects, 9, Ely-place, Holborn :—

W. Gladding	£364	E. Green*	£300
Mattock Bros.	315	* Accepted.	

LONDON.—For rebuilding eight houses, Pollard-street, Bethnal Green. Mr. William Stone, arcnitect, 2, Great Winchester-street, E.C. :—

Jarvis & Sons	£2,940	Higgs	£2,940
Beale	2,562	Elkington	2,225
Wire & Forrest	2,489		

LONDON.—Accepted for the erection of additional bedrooms at St. Peter's Home, Mortimer-crescent, Kilburn :—
R. A. Yerbury & Sons £1,082

LONDON.—For alterations and additions to three shops, Salmon's-lane, Limehouse, E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C. :—

Hearle & Farrow	£1,570	M. Calnan & Co.	£1,446
S. J. Scott	1,516	A. Webb (accepted)	1,288

LONDON.—Accepted for the erection of a warehouse, Stoke Newington. Mr. A. H. Attwater, architect, of London and Brighton :—
David G. Laing & Son, 2, Duke-street, Adelphi £2,100

MIDLETON (Ireland).—For the erection of dispensary and caretaker's residence, Castlemartyr, for the Union Guardians. Mr. Richard Evans, C.E., 53, South Mall, Cork :—

Coffey	£383	Hegarty	£300
O'Brien	350	Sculley, Midleton*	285
		* Accepted.	

MIDDLESBROUGH.—For the construction of roads, &c., at Asylum, Marton-road, for the Visiting Committee. Quantities by Mr. A. J. Wood, 3, Lancaster-place, W.C. :—
Bastiman Bros., Middlesbrough £3,122

RETFORD.—For converting buildings into two houses, for Mr. F. Bannister. Messrs. Eyre & Southall, architects, Retford and Gainsborough :—

T. Hopkinson	£280	A. Richmond	£256
C. Jones	275	F. Fenton (accepted)	246

RETFORD.—For building house, Victoria-road, for Mr. G. Skipworth. Messrs. Eyre & Southall, architects, Retford and Gainsborough :—

G. Fenton	£480	T. Hopkinson	£420
F. Fenton	465	J. Wilson*	410
C. Jones	455	* Accepted.	

RIPON.—For the construction of sewers, &c. (contract No. 7), for the City Council. Mr. H. L. Johnson, engineer, 14, The Exchange, Bradford :—

F. N. Simpson	£1,776 12 7	Chas. Walker & Co.	£1,562 6 3
A. Braithwaite & Co., 13, Park-square, Leeds*	1,567 8 9	* Accepted.	

ROWLEY REGIS.—Accepted, at a schedule of prices, for the execution of drainage works, for the Urban District Council. Mr. E. B. Marten, C.E., Church-street-chambers, Stourbridge :—
John Mackay, Hereford.

SELSIDE.—For the erection of new schools at Selside, near, Kendal. Mr. John Hutton, architect, Kendal. Quantities by architect :—
Building.—John Thompson, Selside .....
Joinery.—Anthony Nelson, Old Hutton, Kendal .....
Plumbing, Painting, and Glazing.—Lawrence Airey, Kendal £600
Plastering.—Steele & Co., Kendal .....
Sliding Partitions.—John Stones, Ulverston .....

SOUTHAMPTON.—For rebuilding factory premises at Shirley, for Messrs. George Ings & Co., Limited. Mr. William Burrough Hill, architect, Southampton :—

C. Barter	£1,697	Playfair & Toole	£1,530
H. Cawte	1,587	H. Stevens & Co.*	1,460
Jenkins & Son	1,546	* Accepted.	

[All of Southampton.]

STOCKPORT.—For the erection of a boundary wall, Castle-yard for the Corporation. Mr. J. Atkinson, C.E., Borough Surveyor, St. Petersgate, Stockport :—

J. Briggs	£145	W. C. Broadhurst & Co., Stockport (accepted)	£125
D. Mullaney	127		

STOCKPORT.—For additions to Turkish baths, St. Petersgate, for the Corporation. Mr. J. Atkinson, C.E., Borough Surveyor, St. Petersgate, Stockport :—

W. C. Broadhurst & Co.	£140 0	T. Hoe, Hooper-street, Stockport (accepted)	£109 1

STOCKWITH (East).—For building Board schools for 156 children, for the School Board. Messrs. Eyre & Southall, architects, Retford and Gainsborough. Quantities by the architects :—

J. R. Herratt	£1,243 3 9	F. Beastall	£1,100 0 0
W. Colley	1,233 10 0	J. Woods*	1,076 0 0
T. Hopkinson	1,178 0 0		

* Accepted subject to Department's approval.

STANLEY (Durham).—For the execution of road works, Mary-street, &c., for the Urban District Council. Mr. J. Routledge, surveyor, Council Offices, Stanley. Quantities by the Surveyor :—

Geo. T. Manners	£1,576 2 10	J. Wardlow	£1,192 1 1
Wm. Johnson	1,432 7 0	Jos. Goldsborough, Chester-le-Street*	1,183 18 0
A. Goldsborough	1,228 12 1		

*Accepted.
[Surveyor's estimate, £1,432 5s. 3d.]

TADCASTER.—For the supply of broken granite road metal, &c., for the Rural District Council. Mr. Thomas Scott, surveyor, Aberford, near Leeds :—

	s. d.		Tons.
Granite.			
Ord & Maddison	11 1	per ton for	1,000
Bradley Bros.	11 1	,, ,,	,,
Geo. Hodsman	11 1	,, ,,	,,
Jno. Delaney	10 6	,, ,,	,,
Shap Granite Company, Ltd.	10 8	,, ,,	,,
Summerfeld & Mead	9 6	,, ,,	500
Whin.			
Chas. Hornsey	10 3	,, ,,	500
G. F. J. Bolglase	10 11	,, ,,	1,500
Slag.			
Geo. Hodsman	7 3	,, ,,	1,000
Leeds Steel Company, Ltd.	5 9	,, ,,	,,
John Green & Co.	7 5	,, ,,	,,
Limestone.			
John Green & Co.	7 1	,, ,,	3,000
Skipton Rock Company, Ltd.	6 8	,, ,,	1,000
Total			14,500

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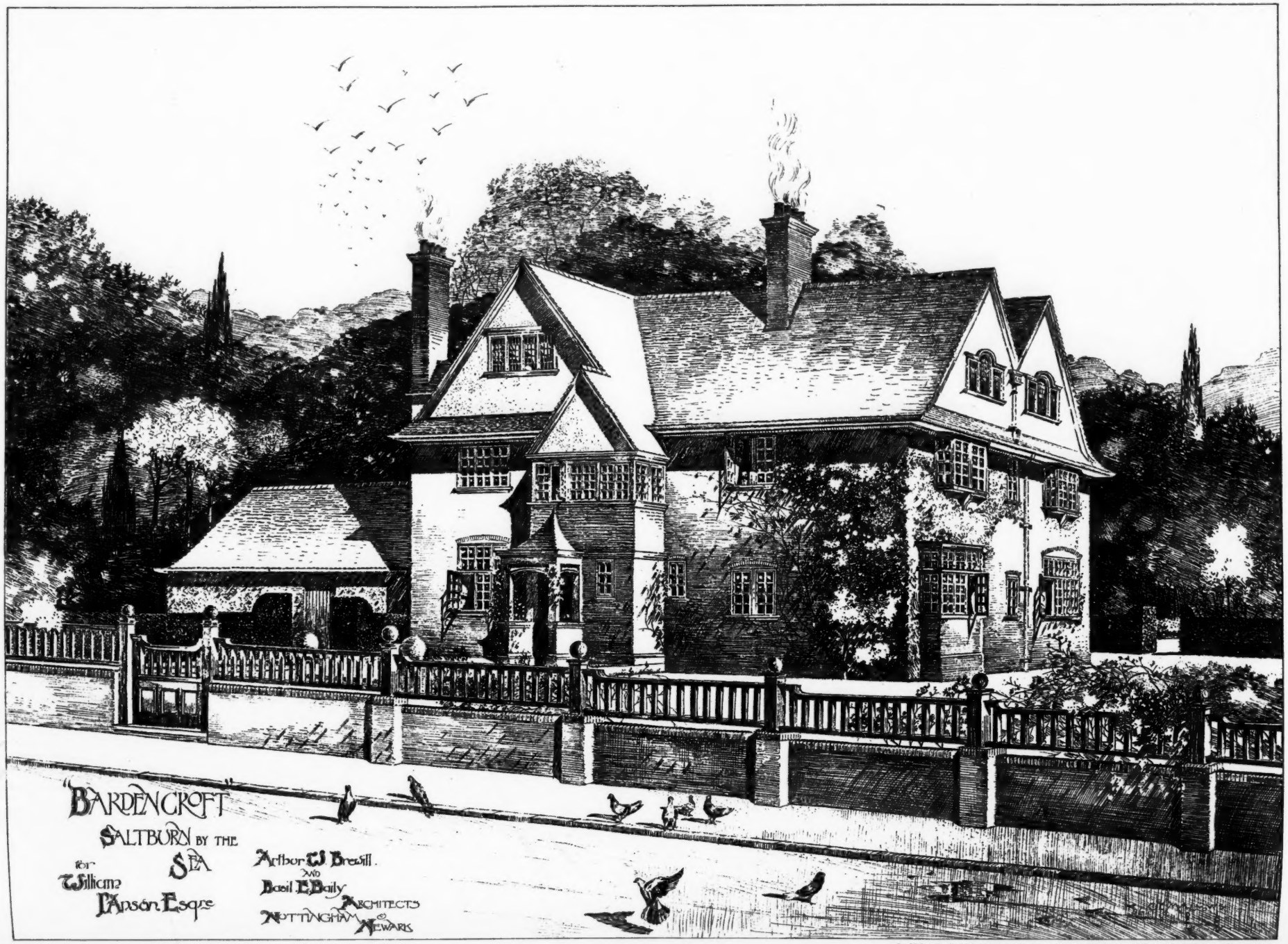

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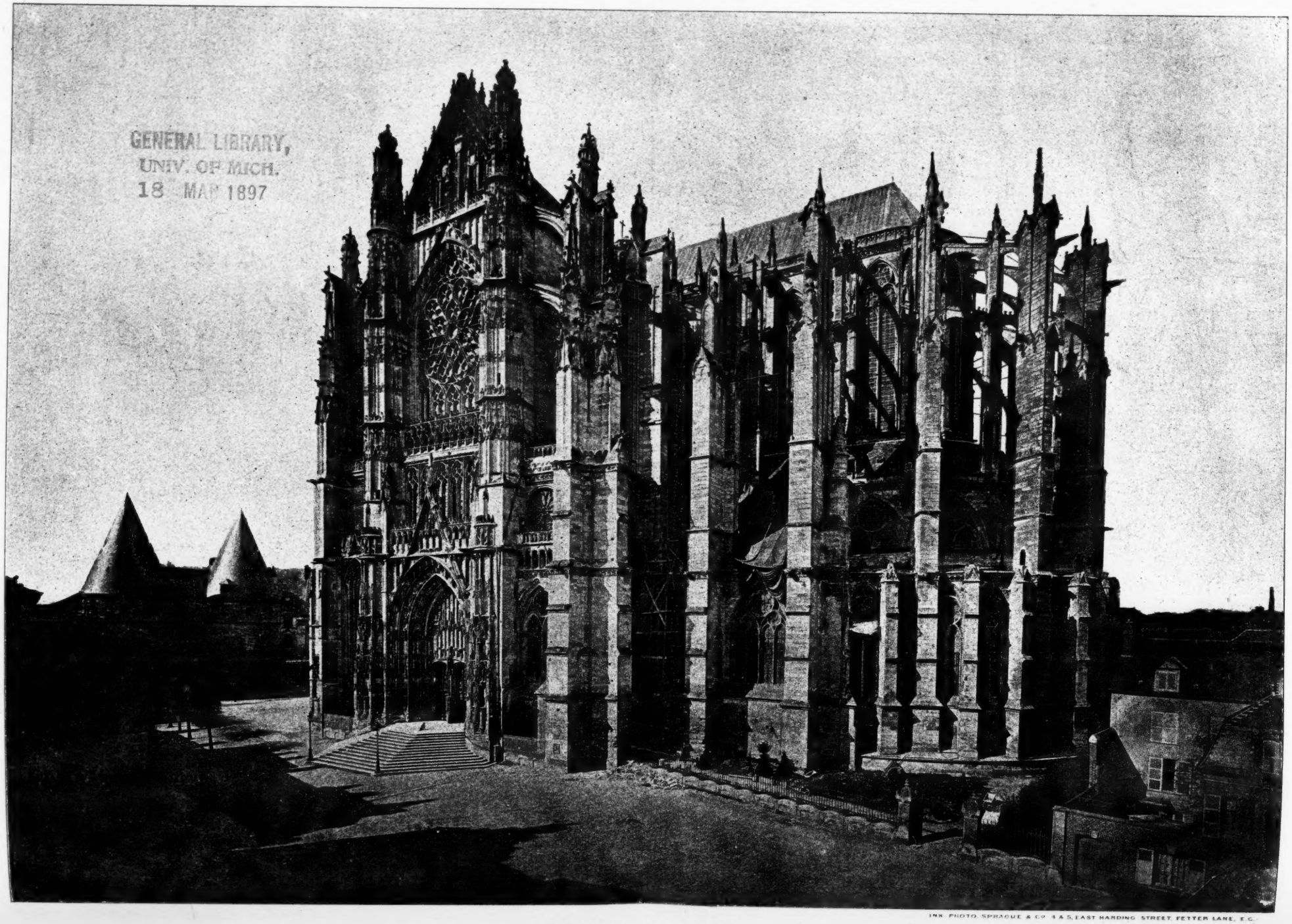

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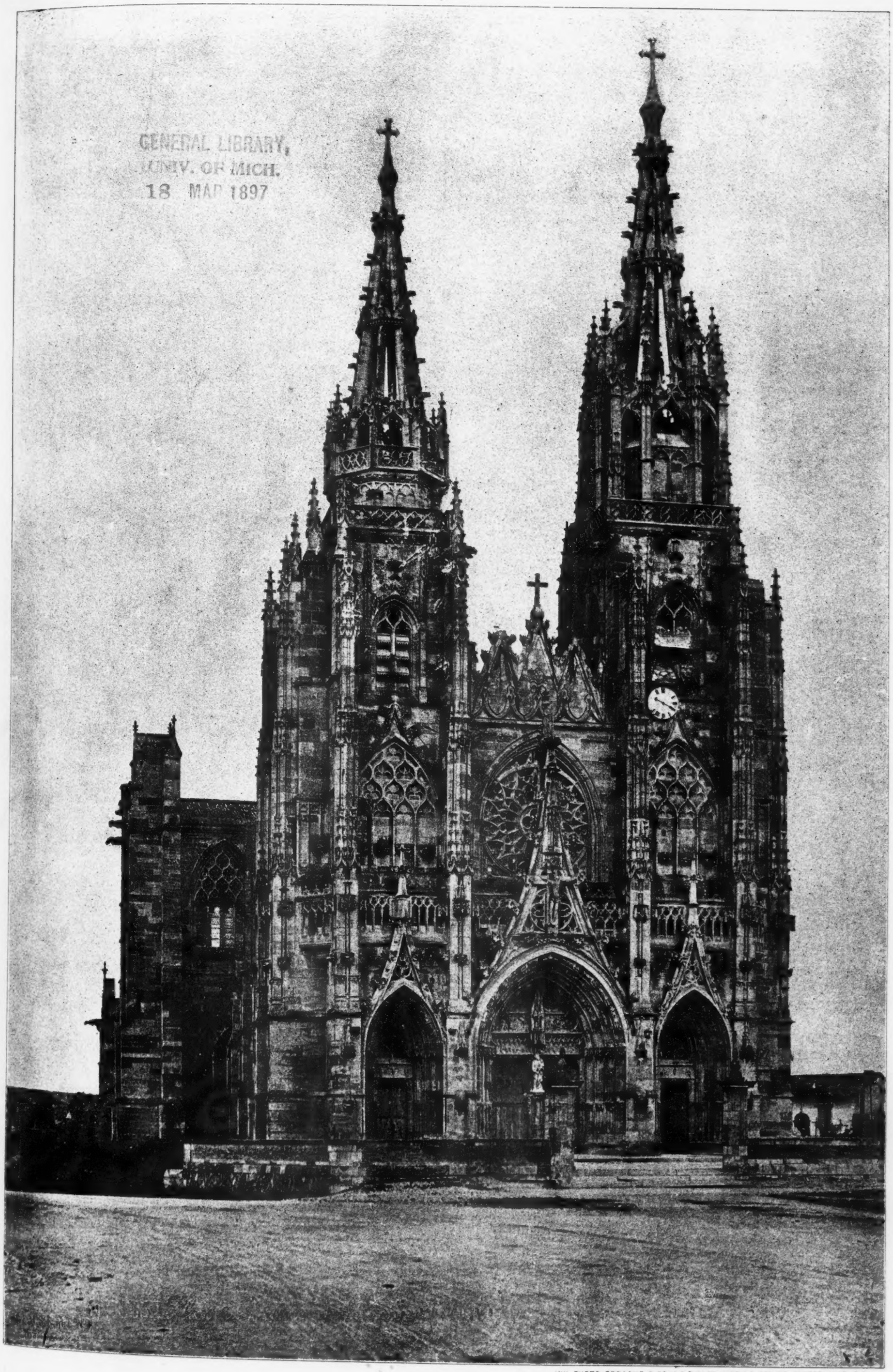

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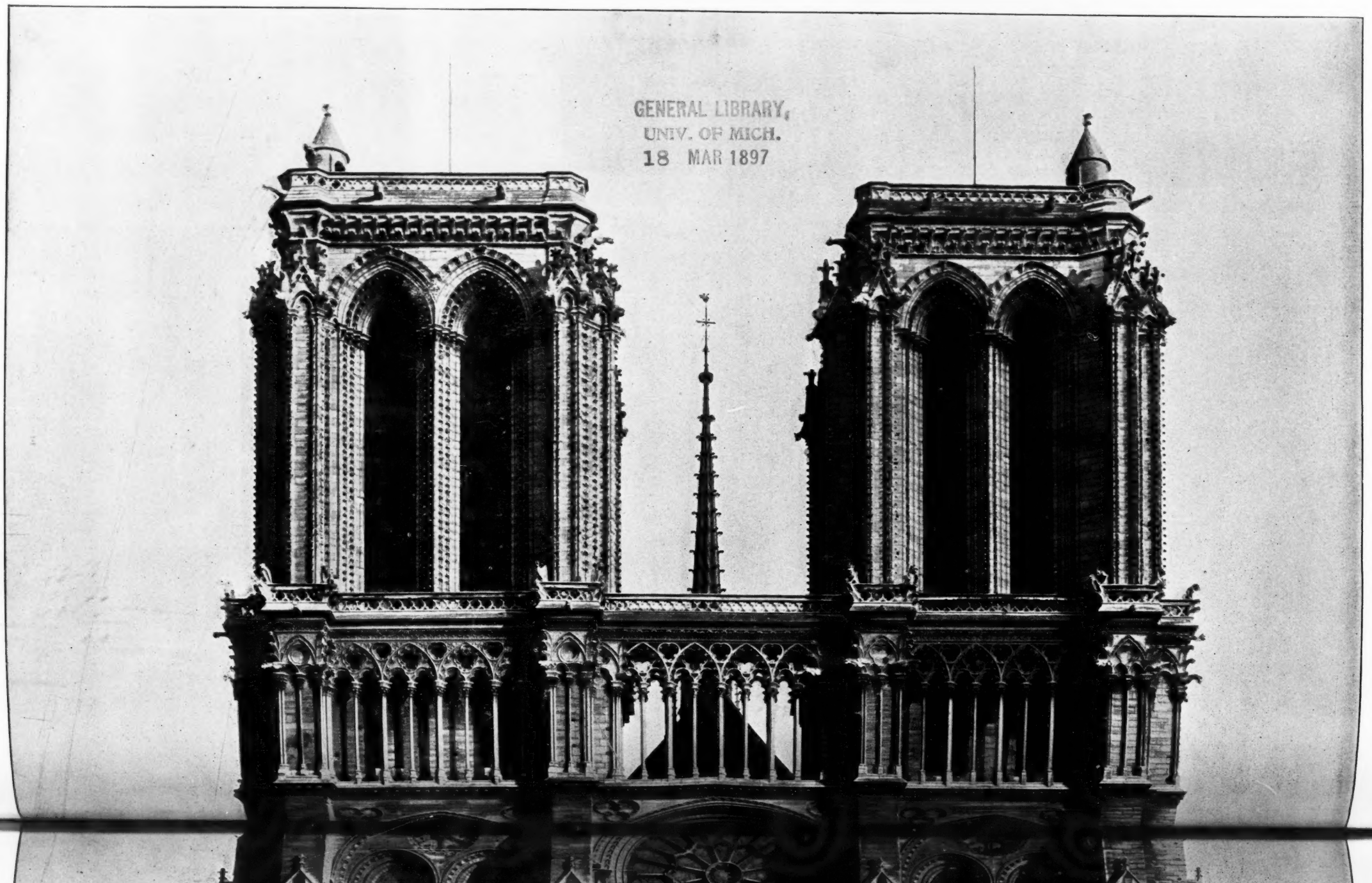

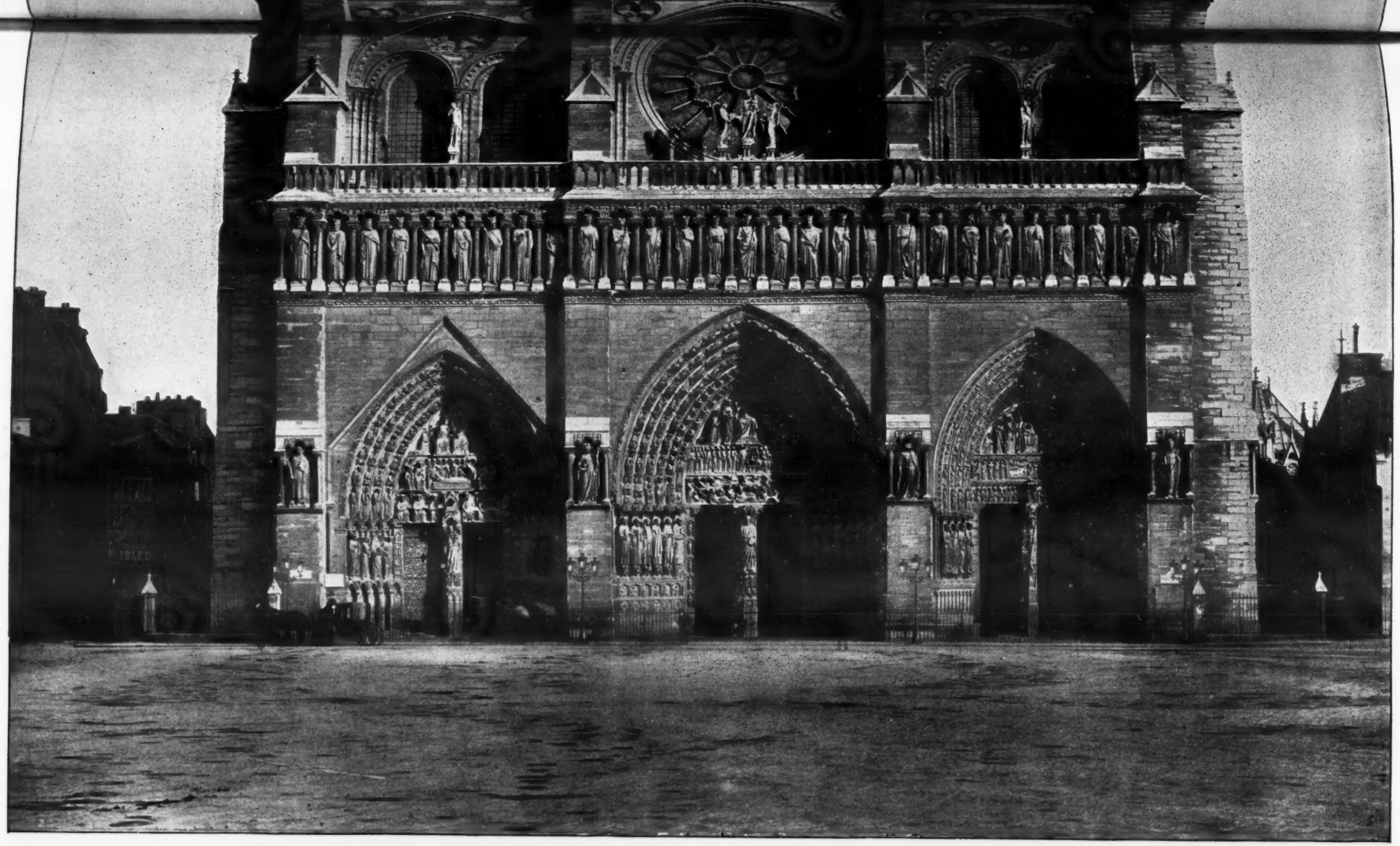

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